

ENTHUSIASM HIGH FOR METAL CONGRESS AND EXPOSITION

A. I. M. E. EVENTS TO DRAW A BIG CROWD

Technical Programs, Banquet Have Interesting Features

Whether by the Mohawk Trail, Sound steamer, airplane, railroad or any other route or mode of locomotion, all roads will lead to Boston the week of National Metal Congress, September 21-25. The Institute of Metals and Iron and Steel divisions of the American Institute of Mining and Metallurgical Engineers are then to meet jointly at the Hotel Statler.

The officers of the Institute of Metals Division are: Sam Tour, chairman; Zay Jeffries, past-chairman; J. R. Freeman, Jr., vice-chairman; C. H. Mathewson, vice-chairman; William M. Corse, secretary-treasurer. John L. Christie and E. M. Wise, respectively chairman and vice-chairman of the Division's Papers and Publications Committee, have been active in organizing the technical program for the meeting.

F. M. Becket is chairman of the Iron and Steel division, W. J. MacKenzie, past-chairman; C. B. Murray, vice-chairman; W. E. Ruder, vice-chairman; F. N. Speller, vice-chairman, and A. B. Kinzel, secretary. The program committee of this division consists of C. E. Meissner, chairman; Walter Crafts, G. B. Waterhouse and Clyde E. Williams.

A.I.M.E. members will register just outside the Georgian room of the Statler Hotel on Monday morning. Starting Tuesday morning there will be six technical sessions for which have been prepared a total of 23 important papers. On Thursday afternoon Dr. P. W. Bridgman, Hollis Professor of Mathematics and Natural Philosophy, Harvard University, will present the Science Lecture. His subject is "Recently Discovered Complexities in the Properties of Simple Substances." On Friday afternoon R. J. Cowan will present a paper on "The Development of Continuous Gas Carburizing," at a joint session of the American Society for Steel Treating and the Iron and Steel Division at which the principal topic will be nitriding and carburizing.

The lecture by Dr. Bridgman, who has made extensive researches in high pressure, promises to be of great interest and importance to every metallurgist and scientist at the meeting in Boston. He will outline a number of recent pieces of work seemingly unrelated in appearance, but all bearing on the main theme; the ideas of Smekal as to sensitive and insensitive properties of materials, and the extension of his ideas and experiments carried on at Pasadena by Goetz and Zwicky, the measurements by Schubnikow at Leiden showing the extraordinary sensitiveness to impurity of the magnetic behavior of bismuth and the complexity of the ultra pure material, the experiments of Simon on the thermal and volume anomalies of some of the ammonium halides and the extensions of this by himself to high pressures and the probable applications to other substances.

LADIES WILL LEARN BOSTON'S INTEREST

Entertainment Program Lists Drives Around Old City

The lucky ladies going to Boston for the National Metal Congress and Exposition, Sept. 21-25, will certainly know that part of the country well by the time they regretfully come to leave.

The committee in charge of entertaining the visiting ladies has spread itself in the matter of providing rides through the city and its environs. On Monday, the first day of the Convention, the ladies will attend a "get acquainted" luncheon at the Hotel Statler. This will be followed by a trip through the Fenway and the other beautiful park sections of Boston.

Tuesday the field is extended to include not only the best sights in ancient and modern Boston, but a trip to Salem, where they hanged the witches and preached soul-searing sermons, and to Marblehead, a lovely little sea town.

On Wednesday, Brookline and Cambridge, political divisions of Greater Boston, will be visited, and the ride includes a trip through Harvard and M. I. T. grounds. Lexington and Concord, of Revolutionary War fame, will then be visited after a drive along historic Boston Post Road. Wayside Inn is a stopping place on this trip.

Thursday several shopping tours have been arranged, but on Friday nothing is planned, as the ladies will undoubtedly want to revisit some places or discover other interesting things to see and do.

Continued on Page Two

A.S.S.T. REGISTRATION DESKS ARE ON COMMONWEALTH PIER

A. W. S. Gathers at Copley Plaza; Other Societies Register at Statler

The convenience of the thousands who are expected to attend the events of the National Metal Congress and Exposition in Boston the week of Sept. 21 was remembered when the registration facilities were planned.

Arrangements have been made to avoid long queues of men waiting to receive the badges which will admit them to the Exposition and to the various sessions for the presentation of technical papers.

On Commonwealth Pier, where the Exposition will be held, an ample number of desks will be set up for registering members of the A. S. S. T. The A. I. M. E., the A. S. M. E. and the S. A. E. will register at the Hotel Statler. Members of the A. W. S. will register at desks in the headquarters of that society, the Copley Plaza Hotel, and also at the Pier.

S.A.E. JOINS CONGRESS MEETS ON SEPT. 23

Sponsors Own Session at the Statler; Will Attend Others

This year the Society of Automotive Engineers is cooperating with other engineering societies by having a technical session at the National Metal Congress to be held in Boston in connection with an exhibition during the week Sept. 21 to 25.

The S.A.E. will hold its technical session in the Georgian Room of the Hotel Statler on Wednesday morning, Sept. 23, at 9:30 o'clock. F. P. Gilligan, chairman of the Iron and Steel division of the S.A.E. Standards Committee, will preside. He had been active for many years in the society's work, is a past-president of the American Society for Steel Treating and is a leading authority of wide experience in metallurgical engineering.

The program of the session comprises three timely papers on important subjects, two of which deal with the methods and costs of heat treating and make available valuable information bearing more on the economics of the subject than on its purely metallurgical phases. One of these two S.A.E. papers is to be presented by E. F. Davis, the metallurgist of the Warner Gear Co., and the other by Dr. Haakon Styri, of SKF Industries, Inc.

The third paper at the S.A.E. sessions, which is to be read by F. W. Shipley, foundry metallurgist of the Caterpillar Tractor Co., is devoted to the metallurgical characteristics and advantages of alloyed cast irons, particularly for use in cylinder castings.

The number of papers to be given at this session has been limited by the society so that each can be presented in full and ample time allowed for general discussion. Preprints of the papers are expected to be available prior to the week of the Congress, at the offices of the society, 29 West 39th Street, New York City.

At the technical sessions of the other national organizations cooperating in the Metal Congress, a number of papers will be presented that are of more or less direct interest to the automotive industry. Complete technical programs and list of plants to be visited appear on pages 2, 8 and 12 of this newspaper. The technical program of the Society of Automotive Engineers is on page 12.

OCTOBER "METAL PROGRESS" IS UNUSUALLY INTERESTING

Continuing its policy of covering each month a wide range of metal subjects by means of authoritative articles, the October issue of *Metal Progress* lists in its table of contents articles which are practical, others which are educational and still others which are newsworthy accounts of interesting plants and practices related to metals.

One author discusses in some detail the utility of a gas atmosphere of dissociated ammonia. He considers the practical relationship of such an atmosphere to present heat treating problems in a way that will interest many.

Two papers scheduled for the A. S. S. T. programs of the National Metal Congress will be published in the October issue. Thomas Dockray, Eastern Rolling Mill Co., has written a paper, "Evaluation of the Drawing Quality of Extra Deep Drawing Sheets," for the sheet steel session and this will appear in *Metal Progress*. One of the melting session papers, "Melting of Tool and Other High Grade Steels in the Basic Electric Furnace," will also be printed

Where Four Societies Will Gather



Hotel Statler in Boston will be headquarters of the A.S.S.T., A.I.M.E., A.S.M.E. and S.A.E. during the National Metal Congress, Sept. 21-25

CHAPTER PROGRAM PLANS HINT AT HIGHLY SUCCESSFUL YEAR

Several Joint Meetings Listed

Plans for the 1931-1932 season of meetings of the 37 chapters and groups of the A. S. S. T. are shaping up well as the officials of the separate chapters resume activities after the summer vacation season.

Many chapters have arranged for speakers for every meeting, and most of the others have made tentative arrangements. Scheduled programs call for a great variety of subjects presented by the most competent and most authorities.

The "symposium" type of meeting is one which has proved popular in recent seasons. A definite subject is chosen and a number of talks are prepared by various members of the chapter holding the meeting.

Several joint meetings of two or more chapters will again be held as experience has shown that this type of meeting arouses keen interest.

BUS FROM HOTELS TO PIER

Plan Frequent Service, Minimum Rates From Societies' Headquarters to Show

A fleet of chartered busses will operate on regular schedules between the Hotel Statler and Copley Plaza and the Commonwealth Pier in Boston during the week of the National Metal Congress and Exposition, Sept. 21 to 25, 1931.

Arrangements which have been made with a Boston bus line provide ample accommodations for all visitors to the Exposition between the headquarters of the various societies in the two hotels and Commonwealth Pier, where the great show will be held.

From 11 a.m. and 2:30 p.m. busses will leave the hotels every fifteen minutes, beginning at the Statler on the hour. From 2:30 p.m. until 8:30 in the evening the busses will maintain half-hour service. Fare one way will be \$0.25 per person.

DR. HONDA HEADS TOHOKU UNIV.

Dr. Kotaro Honda, honorary member of the A. S. S. T., has been elected president of the Tohoku Imperial University at Sendai, Japan.

SEPT. 22 WILL BE BIG DAY OF A.S.M.E.

Three Technical Papers and Two Fine Movies on Program

Tuesday, Sept. 22, will be A.S.M.E. day at the National Metal Congress in which the Machine Shop Practice division, Iron and Steel division and the Boston section of the A.S.M.E. will participate. On Tuesday morning the A.S.M.E. members and guests will have a session on sheet rolling in which their Iron and Steel division is cooperating, or taking an inspection trip to Watertown Arsenal.

Tuesday afternoon at Hotel Statler a session is being held under the auspices of the Machine Shop Practice division in which the following papers will be presented: "Power Transmission with Cast Iron Pulleys and with Paper Pulleys" by Professor C. A. Norman and G. N. Moffatt of Ohio State University. This paper is a result of some work on belt transmission by the authors and gives details on transmission efficiency on various types of belts on cast iron and paper pulleys going thoroughly into the transmissive power of oak tan and rubber belts on such pulleys with bearing contact angle.

Second paper will be on "Positive Drive Equipment" by C. R. Weiss, chief engineer of the Link Belt Co., Indianapolis. The paper covers various forms of chain drives, and various forms of geared speed reducers. Mr. Weiss has been with the Link Belt Co. for over twenty years and is an authority on the subject.

The third paper will be "Radiographic Inspection of Steel Castings and Welded Structures" by H. R. Isenberger of the St. John X-Ray Service Corp. The author discusses in his paper, the relative value of X-ray and gamma inspection with the results and applications possible. The author lists the principal undesirable conditions in steel casting and in welding that are revealed by the radiographic examination.

The session will close with two films, one from the Westinghouse Electric & Mfg. Co., showing some of their research work in gears and the second one on German machine tool progress as exhibited in operation at the Leipzig Trade Fair.

The program of the A.S.M.E. was arranged by F. C. Spencer, chairman of the Machine Shop Practice division and assistant superintendent of manufacturing development, Western Electric Co., Kearny, N. J.; Professor C. de Zafra, New York University, secretary of the Machine Shop Practice division; J. H. Hitchcock, secretary Iron and Steel division, research fellow, Carnegie Institute of Technology, and Professor Harold Berry, Harvard University and chairman of Boston A.S.M.E. section.

HOURS OF EXPOSITION

The National Metal Exposition will open at noon on Commonwealth Pier, Boston, Sept. 21. It will be open throughout the week from noon to 10:00 P. M. except on Thursday when it will close at 6:00 P. M.

FEILD WITH RUSTLESS IRON CORP.

Alexander L. Feild was appointed director of development and research of the Rustless Iron Corp. of America, effective July 1. Mr. Feild, an active worker in the A. S. S. T. and member of the Publication Committee, was previously with the Simonds Saw & Steel Co.

SHOW IS 50% GREATER THAN IN 1930, AND TECHNICAL PAPERS LIST LIKEWISE LARGER

This Newspaper Gives Complete Information on All Phases of Activity of the Five Cooperating Societies

A fifty per cent increase over 1930 in the amount of space sold for the National Metal Exposition in Boston the week of Sept. 21, 1931, is only one indication of the unusual interest manifested in these annual educational high lights in the metal industries. Equally important is the fact that 56 technical papers of highest quality are scheduled on the programs of the American Society for Steel Treating, an increase of 44% over last year. Similarly large and interesting programs have been scheduled by the four other cooperating societies, the American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Welding Society, and Society of Automotive Engineers.

A.W.S. HEADQUARTERS THE COPLEY PLAZA

Members Will Register There and Get Official Badges

The American Welding Society program for the National Metal Congress, Sept. 21-25, in Boston, is outstanding in quality of papers and variety of subjects covered. The complete program is printed elsewhere.

Members of the A.W.S. are requested to register immediately upon arrival at the Hotel Copley Plaza, official headquarters, as admission to exposition and participation in social events and inspection trips will be by badge only.

Upon registering they will be furnished with a copy of the program containing papers to be presented at the technical sessions. The supply of Journals is limited one to each registrant, and on this account they are urged to retain their copies throughout the meeting.

All technical sessions and committee meetings will be held at the Copley Plaza Hotel. All sessions will start promptly as scheduled.

GOLDEN GATE OPENS COURSE

The courses in metallurgy sponsored annually by the Golden Gate chapter opened in August, according to word received from San Francisco. The lecture course, covering ore mining, steel making by the various processes, and the heat treatment of carbon and alloy steels began on Aug. 14.

Previous graduates of the lecture course were eligible to enroll in the practical laboratory course which held its first meeting on Aug. 11. Both courses meet weekly at the Humboldt Evening High School in San Francisco.

3 GROUPS BANQUET DURING CONGRESS

Dinners Planned by A.S.S.T., A.I.M.E.; A.W.S. Has Dance, too

That the social side of the National Metal Congress and Exposition has not been neglected is evidenced by the fact that three of the societies are planning banquets and entertainment programs.

The American Society for Steel Treating will hold its annual banquet in the grand ballroom of the Statler on Thursday evening, Sept. 24. Neal O'Hara, nationally known humorist and entertainer, will address the diners during the evening. Other features at this banquet include the presentation of the President's Medal to Robert G. Guthrie of Chicago, president of the Society in 1930, and the award of the Henry Marion Howe Memorial Medal to the author of paper judged highest in merit and published in *Transactions* during the past year. Tickets for the banquet may be obtained from the special information desk on the mezzanine floor of the Statler or at the registration desks on Commonwealth Pier.

The joint dinner of the Institute of Metals and the Iron and Steel divisions of the A.I.M.E. will be held in the Georgian Room of the Hotel Statler at 6:30 p.m., Wednesday, Sept. 24. Alan Kiscock, vice-president of the Climax Molybdenum Co., will give a non-technical talk on molybdenum as the principal speaker.

The American Welding Society will hold its annual banquet Thursday evening at its headquarters in the Hotel Copley Plaza. A dance will follow.

The exhibits will cover 60,000 square feet in the immense Commonwealth Pier. Gas and electric furnaces in all sizes will be operating at temperatures up to 2550 degrees during the show; in one section brilliant flashes of light will indicate that demonstrations of arc and gas welding are being made under operating conditions; displays of almost every kind of steel and such economically important non-ferrous metals as aluminum, copper, zinc, and other metals and alloys will attract thousands of engineers and other executives in metal producing or fabricating plants.

Countless other raw materials, tools, equipment, and products will be exhibited. A complete list of exhibitors together with a description of their booths begins on page 5.

The Congress and Exposition are sponsored each year by the American Society for Steel Treating with the cooperation of the other national technical societies. In addition to the A.S.S.T. technical program, sessions have been arranged by the Institute of Metals and the Iron and Steel divisions of the A.I.M.E.; the Iron and Steel and the Machine Shop Practice divisions of the A.S.M.E.; and the S.A.E. and A.W.S. Programs of the various societies will be found elsewhere in this paper, on pages 2 and 12.

The Hotel Statler has been chosen as headquarters of all the societies except the Welding Society, which will hold all of its meetings in the Hotel Copley Plaza. Every technical session of each society will be held in the hotel headquarters.

More than 75,000 engineers and executives of metal plants are expected to visit the Exposition, at least 12,000 of whom will go to Boston from other important cities where the manufacture of metals and metal products is important.

TECHNICAL SESSION CHAIRMEN NAMED FOR A.S.S.T. MEETINGS

Two Chairmen at Each Meeting

Dr. Zay Jeffries, consulting metallurgist for the Aluminum Co. of America and the General Electric Co. and past president of the A.S.S.T., has agreed to serve as chairman of the meeting in Boston on Sept. 23 at which the annual Campbell Memorial Lecture will be presented. Dr. C. H. Herty, Jr., U. S. Bureau of Mines Experiment Station in Pittsburgh, will deliver the Campbell Lecture.

Two chairmen will preside at each of the other technical sessions of the Society during the Congress. Each one will be in the chair during the presentation of half of the papers in each session.

Those who have accepted chairmanships for the various A.S.S.T. sessions are:

W. E. Ruder, General Electric Co., Schenectady; Dr. Frances Hurd Clark, Western Union Telegraph Co., New York; H. J. French, International Nickel Co., Bayonne, N. J.; R. S. Archer, A. O. Smith Corp., Milwaukee.

Howard J. Stagg, Halcomb Steel Co., Syracuse; H. M. Boylston, Case School of Applied Science, Cleveland; Dr. Albert Sauveur, Harvard University, Cambridge.

G. B. Waterhouse, Massachusetts Institute of Technology, Cambridge; G. V. Luerssen, Carpenter Steel Co., Reading, Pa.; J. P. Gill, Vanadium Alloys Steel Co., Latrobe, Pa.; Jerome Strauss, Vanadium Corp. of America, Bridgeville, Pa.

E. C. Bain, United States Steel Corp., Kearny, N. J.; Prof. Bradley Stoughton, Lehigh University, Bethlehem, Pa.; T. H. Nelson, consulting metallurgist, Philadelphia; M. A. Grossmann, Republic Research Corp., Canton, Ohio.

V. O. Homerberg, Massachusetts Institute of Technology, Cambridge, Mass.; A. B. Kinzel, Union Carbide and Carbon Research Laboratories, Long Island City, N. Y.

THE REVIEW

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A Review of the Activities of the Chapters and National Organization of the A. S. S. T.

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8 Boston Plants Open to Visitors

The firms which have opened their plants for visitors at the Congress and Exposition are listed below with the dates scheduled. Please purchase bus tickets a day in advance of the visit. Get them at Commonwealth Pier in the afternoon and at Hotel Statler in the morning. Busses leave main entrance of Hotel Statler at 8:15 A. M.

TUESDAY MORNING, SEPT. 22

Watertown Arsenal. This arsenal is the manufacturing and development plant of the War Department. Many novel features of manufacturing and much interesting military equipment will be seen. Features of the trip will be casting guns by the centrifugal process; coldworking; welding of gun carriage parts; detection of defects; and the metallurgical laboratory.

WEDNESDAY MORNING, SEPT. 23

Bethlehem Shipbuilding Corp., Fore River plant. This plant employs about 5,000 men in all manner of trades, steel fabrication, foundry, blacksmiths, joiners, machinists, boiler-makers, electricians, etc. The Mariposa, Pacific liner of the Matson Line is at the outfitting dock. On the ways are three ships for the United Fruit Company, the Monterey, a sister ship to the Mariposa, and the Portland, a 10,000-ton scout cruiser.

Boston Gear Works and Pneumatic Scale Co. The plants are adjacent to each other so visitors will see both. Features of the Boston Gear Works are turning operations on gears, including automatic screw machine, automatic chucking and hand turret operations; tooth forming and grinding; heat treating.

The Pneumatic Scale Co. makes packaging and weighing machines for loading bulk manufactured materials of all kinds into the bags, jars and containers in which the materials reach the ultimate consumer.

THURSDAY MORNING, SEPT. 24

General Electric Co., River Works, Lynn. Features of the visit include making of fused quartz astronomical mirrors, vitreous enamel and the manufacture of frit from raw materials, grinding and application of enamels to reflectors. Welding operations include spot and atomic hydrogen welding, gas cutting of metals, electric arc fabrication of machinery frames, and copper brazing. Also making of large reduction gears and pinions, heat treating departments, forge and hardening department.

Naumkeag Steam Cotton Co., Salem. This company is a very large manufacturer of cotton goods and other textiles.

FRIDAY MORNING, SEPT. 25

United Shoe Machinery Co., Beverly. Shoe making and repairing machinery is made here. Features include all manner of metal forming operations, heat treating and hardening.

Walworth Co. Various types of pipe wrenches, brass fittings and valves are made here. Features will include screw machine operations, an extensive forge shop, brass foundry, heat treating and finishing operations.

273 NEW JERSEY MEN AT CHAPTER PICNIC

Members Vie for 120 Prizes; Ball Game Is Day's Feature

By Joseph Sammon

The annual outing of the New Jersey chapter was held June 27, at Doerr's Grove in Livingston, N. J. The picnic committee had anticipated a large attendance, but as the weather was ideal we had a bumper crowd, there being 273 paid admissions. We also had a number of honored guests, including R. M. Bird, Bethlehem Steel Co., W. B. Coleman, W. B. Coleman Co., J. R. Adams, Midvale Co., and B. F. Shepherd, Ingersoll-Rand Co.

The usual outdoor games and contests were enjoyed by all. Two rival ball teams vied for supremacy on the diamond, among the feature games being a contest between Driver-Harris captained by Harry McKinney, who played an erratic game at third base, and Hyatt Roller Bearing, captained by Jimmie Heath. This was a seven inning contest, but the score is still a secret.

A total of 120 prizes were contributed by our many good friends in the manufacturing line, and these were distributed to the winners of various contests, and also to the holders of lucky numbers as door prizes.

To make a success of such a large affair as this requires considerable planning, and untiring effort, and our new chapter chairman, J. F. Wyzalek, and G. S. Walters, who was chairman of the outing committee, are to be congratulated on their success in getting such a large turnout.

LADIES ENTERTAINMENT PLANS READY FOR CONGRESS

(Continued from Page One)

Mrs. H. E. Handy, 84 High St., Saco, Me., is chairman of the ladies committee. Assisting her are Mrs. E. B. Ashworth, Mrs. A. D. Bach, Mrs. E. L. Bartholomew, Mrs. J. M. Darke, Mrs. E. N. Downing, Mrs. J. P. Flagg, Mrs. J. N. Harkins, Mrs. V. O. Homerberg, Mrs. R. A. Johnston, Mrs. A. Krebs, Mrs. H. P. Peabody, Mrs. H. C. Pearson, Mrs. T. A. Wry, Mrs. L. E. Zurbach.

Headquarters of this committee will be in Parlor F on the mezzanine of Hotel Statler.

ENGLISH DOLE NOT USELESS, IS BELIEF

U. S. Executive Finds Opinion Changed; Europe Optimistic

Major Aaron E. Carpenter, first vice-president of E. F. Houghton & Co., Philadelphia, has revealed a number of interesting facts which he learned during his recent two-month stay in Europe.

In talks with English bankers and industrial leaders, Major Carpenter was surprised to find a great change of opinion regarding the so-called dole. He states: "For one thing, the dole eliminates bread lines; and, since it is largely paid by the manufacturer and the State, it is equally distributed and is enough to provide for actual necessities."

"England is apparently overpopulated, and the dole relieves many of the grave economic problems which today are so prevalent in this country. As a result, the burden is not shouldered by private charities, which, generally speaking, would be inadequate to meet the demands."

Asked about general business conditions abroad, Major Carpenter states that, in his opinion, the situation is more hopeful in France and England than in America. From men prominent in industrial circles he learned that there are only 45,000 people out of work in France—a country of 42,000,000 inhabitants. It is true that many industrial plants are running on short time, but, so far, there have been few shutdowns.

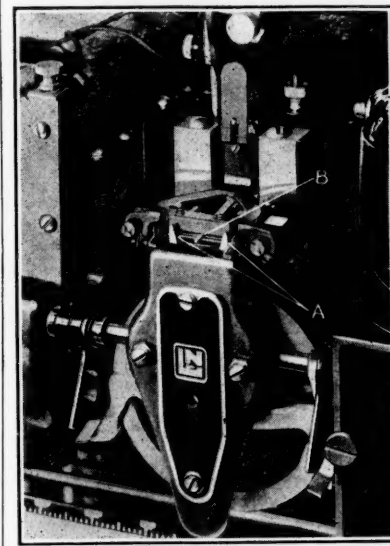
In England, the ranks of the idle have been thinned by 250,000 since January 1. While business is by no means thriving, the general outlook is increasingly optimistic.

During his visit, Major Carpenter inspected the newly constructed Houghton oil manufacturing plant in Trafford Park, near Manchester. Trafford Park, well known to business men of this country, is already the site of twenty-five or thirty American manufacturing plants, warehouses, and distributing points.

New L&N Pyrometer Bows to Industry

Introduction of an improved L. & N. potentiometer pyrometer has been made by the Leeds & Northrup Co., Philadelphia. The instrument has been given the name of "Micromax" to distinguish it from the preceding potentiometer pyrometer which this company has built since 1910. Announcements of this improved instrument describe it as climaxed over 20 years of specialized building of potentiometer pyrometers, combined with 3 years' concentration on the proving of Micromax features.

"The Micromax Pyrometer constitutes a major contribution to accurate,



reliable measurement and control of industrial temperatures," states an official of the company. "It is more sensitive, more rugged, and is faster in operation. It is fully automatic and eliminates daily attention and adjustments. These advantages are obtained by the new mechanical balancing device, shown in the accompanying photograph, and the automatic standardizer, which checks the instrument circuit. L. & N. Recorders now in operation may be equipped with Micromax improvements."

The Micromax balancing device gives micrometer sensitivity, needs no adjustments and is remarkably fast-acting. Due to the complete elimination of operating clearance between galvanometer pointer and levers, pointer deflections as small as 1/1000th of an inch can be detected and recorded. The recording pen can step across the entire calibrated chart in less than 22 seconds, the size of each step being more closely related to the extent of pointer deflection.

The automatic standardizer automatically checks the potentiometer circuit every 45 minutes or less, giving a much closer adjustment than is obtained by hand. Also, the circuit can be standardized at will (as after changing a thermocouple, when a check is desired) before the 45-minute cycle is completed. A new catalog describing the L. & N. Micromax Pyrometer in full detail has been issued, and may be obtained from 4901 Stenton Ave., Philadelphia.

General Alloys Co., Boston and Champaign, Ill., has elected Geo. C. McCormick, chief engineer, as vice president of the company.

56 PAPERS LISTED ON A. S. S. T. PROGRAM AT NATIONAL METAL CONGRESS IN SEPTEMBER

Program is the Largest Yet Assembled by the Society

Fifty-six papers, comprising the largest program yet assembled by the American Society for Steel Treating for presentation at a National Metal Congress, will be read and discussed at the ten A. S. S. T. sessions in the great ball room of the Hotel Statler in Boston the week of Sept. 21, 1931.

The morning sessions begin at 9:30 A. M. and the afternoon meetings at 2:00 in the afternoon, Eastern Daylight Saving Time.

Monday Morning, Sept. 21.

Precious Metal Alloys by R. C. Brumfield, Cooper Union, New York City.
Cemented Tantalum Carbide by Floyd C. Kelley, General Electric Co., Schenectady, N. Y.
The Resistance to Wear of Carbon Steels by S. J. Rosenberg, U. S. Bureau of Standards, Washington, D. C.
Tool Steel from the Consumers' Standpoint by H. G. Keshian, Chase Companies, Inc., Waterbury, Conn.
Division of the Iron Vanadium System Into Some of Its Constituent Binary and Ternary Systems by C. H. Mathewson, E. Spire and C. H. Samans, Yale University, New Haven, Conn.

Monday Afternoon, Sept. 21.

Endurance Properties of Some Well-Known Steels in Steam by T. S. Fuller, General Electric Co., Schenectady, N. Y.
The Characteristics of Deformation of Steel Under Constant Load at Elevated Temperatures by G. R. Brophy, General Electric Co., Schenectady, N. Y.
Behavior of Some Irons and Steels Under Impact at Low Temperatures by Robert Sergeson, Republic Steel Corp., Massillon, Ohio.
Impact Characteristics of Steel Rails at Low Temperatures by J. F. Cunningham and James Gilchrist, University of Manitoba, Winnipeg.
Thermomagnetic Phenomena in Steel by R. L. Sanford, U. S. Bureau of Standards, Washington, D. C.
Thermomagnetic Investigations of Tempering of Quenched 0.75 Per Cent Carbon Steel by C. A. Ellinger, U. S. Bureau of Standards, Washington, D. C.

Tuesday Morning, Sept. 22.

Sheet Steel Session
The Evaluation of the "Drawing" Quality of Extra Deep Drawing Sheets by Thomas Dockray, Eastern Rolling Mill Co., Baltimore, Md.
Thin Strip Steel for Deep Drawing by H. T. Morton and I. A. Rummier, Hoover Steel Ball Co., Ann Arbor, Mich.
Some Effects of the Amount and Rate of Deformation on a Low Carbon Strip Steel by Joseph Winlock and A. E. Laverne, Edw. G. Budd Mfg. Co., Philadelphia, Pa.
Effect of Normalizing Upon the Grain Structure and Physical Properties of Automobile Sheet Steel by Wm. F. McGarrity, Youngstown Sheet & Tube Co., Youngstown, Ohio, and H. V. Anderson, Lehigh University, Bethlehem, Pa.
Plastic Drawing of Sheet Steel Into Shapes by E. V. Crane, E. W. Bliss Co., Brooklyn, N. Y.
Lubricants Used in Deep Drawing of Sheet Steel by Maurice Reswick, Pennsylvania Lubricating Co., Pittsburgh, Pa.
Comparison of Sheet and Strip Steels for Difficult Stampings by Edw. S. Lawrence, Duraloy Co., Pittsburgh, Pa.

Tuesday Afternoon, Sept. 22.

Identification of Inclusions by Leland E. Grant, Chicago, Milwaukee, St. Paul & Pacific R. R., Milwaukee, Wis.
Effect of Heat Treatment Upon Ferrite Banding of Steel by W. E. Harvey and Bradley Stoughton, Lehigh University, Bethlehem, Pa.
Ghost Lines in Forgings by J. F. Harper and H. J. Stein, Allis Chalmers Mfg. Co., Milwaukee, Wis.
Solubility of Oxygen in Solid Iron by N. A. Ziegler, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Scaling of Steel at Elevated Temperatures by Reaction with Gases and the Properties of the Resulting Oxides by D. W. Murphy, Wm. P. Wood, University of Michigan, Ann Arbor, Mich., and W. E. Jominy, A. O. Smith Corp., Milwaukee, Wis.
Aqueous Solutions of Ethylene Glycol Glycerine and Sodium Silicate as Quenching Media by T. E. Hamill, U. S. Bureau of Standards, Washington, D. C.

Wednesday Morning, Sept. 23.

Annual Meeting of A. S. S. T.
Campbell Memorial Lecture by C. H. Herty, Jr.
Melting Session
Melting of Crucible Tool Steel by Owen K. Parmiter, Firth-Sterling Steel Co., McKeesport, Pa.
Open Hearth Process by C. H. Herty, Jr., U. S. Bureau of Mines, Pittsburgh, Pa.
Making of Acid Electric Steel for Castings by George Batty, Steel Castings Development Bureau, Philadelphia, Pa.
Melting of Tool and Other High Grade Steels in the Basic Electric Furnace by J. P. Gill and R. E. Trembour, Vanadium Alloys Steel Co., Latrobe, Pa.
Ingot, Ingot Molds and Castings by G. A. Dornin, Baltimore, Md.
Development of Italian Industry Making Special Steels and Irons by Dr. Federico Giolitti, Torino, Italy.

Thursday Morning, Sept. 24.

The Cold Treatment of Certain Alloy Steels by G. V. Luerssen and O. V. Greene, Carpenter Steel Co., Reading, Pa.
Nature of Abnormal Grain Growth in High Speed Steel by G. R. Brophy and R. H. Harrington, General Electric Co., Schenectady, N. Y.
Some Physical Properties of High Speed Steel by J. V. Emmons, Cleveland Twist Drill Co., Cleveland, O.
Data on Steel Made Without Manganese by Capt. S. B. Ritchie, Watertown Arsenal, Watertown, Mass.
Alloys of Iron, Manganese and Carbon by Dr. F. M. Walters, Carnegie Institute of Technology, Pittsburgh, Pa.
Dendrites in Nickel Steel by Albert Sauveur, Harvard University, Cambridge, Mass., and E. L. Reed, American Sheet & Tin Plate Co., Pittsburgh, Pa.
A Transformation in Pure Iron a motion picture by Leland R. Van Wert, Howard Engineering School, Cambridge.

Thursday Afternoon, Sept. 24.

Age Hardening Phenomena in Typical Fusion Weld Metal by F. R. Hensel and E. J. Larsen, Westinghouse Elect. & Mfg. Co., East Pittsburgh, Pa.
Magnetic and Mechanical Hardness of Dispersion Hardened Iron Alloys, by K. S. Seljesater and B. A. Rogers, Western Electric Co., Chicago, Ill.
Aging in Low Carbon Steels by A. Allan Bates, Case School of Applied Science, Cleveland, O.
Some New Aspects of the Iron Carbon Diagram by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, O.
Surface Energy of Iron Carbide by Yap, Chu-Phay, New York City.
Influence of Special Elements On the Carbon Content of the Iron-Carbon Eutectoid by E. L. Reed, American Sheet & Tin Plate Co., Pittsburgh, Pa.

Friday Morning, Sept. 25.

Stainless Alloy Session
Corrosion Resistant Steels by R. L. Duff, Standard Oil Development Co., Elizabeth, N. J.
Manufacture, Properties and Uses of 18-8 Chromium Nickel Steel Wire by W. H. Wills, Jr., and J. K. Findley, Ludlum Steel Co., Dunkirk, N. Y.
Further Studies on Chromium-Nickel-Iron and Related Alloys by V. N. Krivobok, E. L. Beardman, H. J. Hand, T. O. A. Holm, A. Reggiori and H. S. Rose, Carnegie Institute of Technology, Pittsburgh, Pa.
Influence of Grain Size on the Properties and Corrosion Resistance of the 18-8-Iron-Chromium-Nickel Alloy for Elevated Temperature Service by H. D. Newell, Babcock & Wilcox Tube Co., Beaver Falls, Pa.
Hardness of Chromium as Determined by the Vickers-Brinell, Bierbaum, and Mohs Methods by Richard Schneidewind, University of Michigan, Ann Arbor, Mich.

Friday Afternoon, Sept. 25.

Short-Time Nitriding by J. J. Egan, Union Carbide & Carbon Research Labs., Long Island City, N. Y.
Correlation of the Crystal Structures and Hardnesses of Nitrided Cases by O. E. Harder and G. B. Todd, Battelle Memorial Institute, Columbus, Ohio.
Non-Deforming Alpha-Delta Carbide Steel by A. B. Kinzel, Union Carbide & Carbon Res. Labs., Long Island City, N. Y.
Role of Energizers in Carburing Compounds by George M. Enos, University of Cincinnati, Cincinnati, Ohio.
Inspection of Welds with Gamma Rays by Gilbert E. Doan, Lehigh University, Bethlehem, Pa.
Photomicrographs of Steels with 1 Per Cent Carbon Arranged in Graded Series for Use as Standard by Haakon Styri and H. O. Walp, S K F Research Labs., Philadelphia, Pa.
Development of Continuous Gas Carburing by R. J. Cowan, Surface Combustion Co., Toledo.

YOU SHOULD

HAVE THESE BOOKS FOR YOUR LIBRARY

Published by the A. S. S. T., these books contain sound, practical information that will aid materially in your daily work, and will make a fitting addition to your library.

French, Herbert J.—Quenching of Steel.

172 pages, 6x9, 105 ill., cloth.....\$2.50
Characteristics of various cooling media (coolants) discussed at length. Cooling properties for center and surface cooling of a given mass of steel are treated quantitatively. Graphs and equations facilitate rapid determination of properties of quenched steels.

Sisco, Frank T.—The Constitution of Steel and Cast Iron.

332 pages, 6x9, 105 ill., cloth.....\$3.00
An interesting and well grounded book that meets the demand for a fairly elementary discussion of the theory underlying the constitution and heat treatment of steel and cast iron.

Knowlton, H. B.—Heat Treatment, Properties and Uses of Steel.

437 pages, 6x9, 94 ill., cloth.....\$4.50
A comprehensive book devoted to the treatment and processing of all types of iron and steel, emphasizing shop problems and selection of the proper steels.

Keller, John F.—Lectures on Steel and Its Treatment.

267 pages, 6x9, 166 ill., cloth.....\$3.50
The mysteries of the behavior of iron and steel explained in a simple language by a practical man, who is a blacksmith by trade.

Nitriding Symposium—By Several Leaders in the Field.

222 pages, 6x9, 209 ill., cloth.....\$3.00
Nine papers by leading researchers, covering the process in production and laboratory. Heating cycles, proper and im-

proper nitriding conditions, control of ammonia gas, proper steels and service results of products are discussed at length. Diagrams show nitriding containers, etc. One paper describes nitriding of steel in molten cyanide baths.

Bureau of Standards—Principles of Steel and Its Treatment.

93 pages, 6x9—paper \$1.00, cloth.....\$1.50
A concise treatise on the heat treatment of steel, explaining terms used and the results obtainable. Twenty pages are devoted to a comprehensive bibliography which embraces both books and periodicals.

Wohrman, C. R.—Inclusions in Iron and Steel.

162 pages, 6x9, 138 ill., cloth.....\$3.00
Comprehensive study of inclusions in ferrous metals in which the inclusions are definitely known.

The Welding Encyclopedia.

6th edition, 496 pages, 6x9, illustrated, cloth.....\$5.00
A comprehensive and complete handbook for practical welders. Arranged for easy reference to terms, processes and applications; training of operators, simple rules for safety and efficiency, heat treatment of metals and useful tables.

Hatfield, W. H.—The Application of Science to the Steel Industry.

154 pages, 6x9, 35 ill., cloth.....\$2.50
An excellent review of English steel making, including steel making, manipulation and treatment, special steels, corrosion and acid resisting steels, effect of temperature on steels and tool and cutlery steels.

Prices include postage in U.S.A. Add 50c for foreign delivery.

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"METAL PROGRESS," A.S.S.T. PUBLICATION, WINS WIDE ACCLAIM IN ITS FIRST YEAR

Ernest E. Thum, Editor, Says Success Due to Exclusive Articles Written by Experts for Men who Know Metals

A year ago *Metal Progress* became an official monthly publication of the American Society for Steel Treating. Almost immediately its readers recognized that an entirely new type of magazine had been presented to the metal industries.

"*Metal Progress* is a paper dealing with metals and their alloys, written for men in the metal industries who have a wide and healthy interest in those subjects," Ernest E. Thum, the editor, has stated.

"The training of a research technologist or a laboratorian is not essential to an intelligent understanding of *Metal Progress*, but at the same time enthusiastic response has come from many leaders in research metallurgy.

"The answer is that the original, exclusive articles which have made *Metal Progress* outstanding do not have to be 'written down' to our readers because men who are interested enough in metals to join the A.S.S.T. or subscribe to *Metal Progress* have high standards of education and experience and are anxious to broaden their knowledge of the field of metals.

"A reader who receives much benefit is the man who spends part of his time in the selection, production, or fabrication of metals, but who is at the same time interested in such other plant problems as personnel, production, or manufacturing. Not only steel is covered by *Metal Progress*; copper and its alloys are the subjects of an important percentage of articles, and aluminum, lead, gold, and the rarer metals such as titanium and tantalum are by no means neglected.

"In a word, *Metal Progress* prints real news, exclusively written or interpreted for it by outstanding authorities known to every man in the metal industries and presented to readers in a form as attractive to the eye as the articles themselves are interesting to the mind.

"Every page is planned to show off the text and illustrations to their best mutual advantage. The typography of the magazine was planned by experts and the layouts of the separate pages maintain the ideal of readability and freedom from over-worked conventions of magazine making.

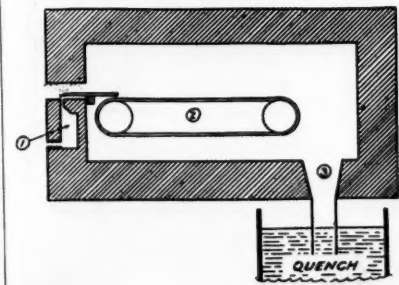
"This ideal of readability and originality has been held by advertising men in recent years and is the reason for the far greater attractiveness and effectiveness of modern advertisements as compared with those of twenty years or so ago. We are proud of the fact that a number of internationally famous typographical experts have pointed to *Metal Progress* publicly and in private communications to us as a pioneer in the endeavor to present technical material in a dignified, attractive style."

By a recent action of the Board of Directors of the A.S.S.T., the subscription price of *Metal Progress* to non-members of the Society was lowered to \$5.00 a year. Checks should be made payable to the American Society for Steel Treating, 7016 Euclid Ave., Cleveland.

A sample copy of *Metal Progress* will be sent on request.

C. I. Hayes Builds Conveyor Furnace

An electrically heated conveyor furnace equipped with the "Certain Curtain" atmosphere control, is a new product of C. I. Hayes, Inc., Providence, R. I. This furnace is designed for production hardening of small tools or parts made of carbon or alloy steels. It provides complete control of the atmosphere within the heating chamber, thus preventing scale, decarburization and other effects of uncontrolled or incompletely controlled furnace atmosphere. The simplified line diagram shows how complete control of atmosphere is accomplished. The furnace is sealed at the delivery end by means of a chute which extends below the surface of the quench. It is sealed at the entrance by the standard Certain Curtain atmosphere control system.

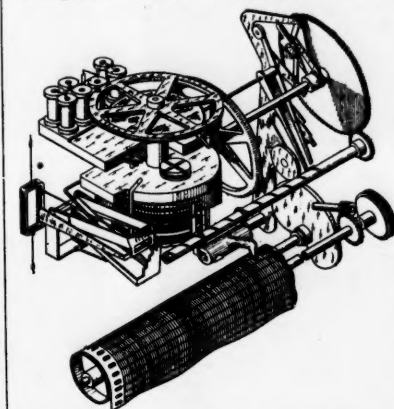


This consists of a separate atmosphere combustion chamber in which a mixture of gas and air is combusted to form the proper protective atmosphere with which to surround the steel. This protective atmosphere pours from a slot across the entrance and fills the furnace chamber and chute, while the pressure of it is such that it forms a curtain across the furnace mouth through which no outside air can enter.

An apparatus for driving the conveyor belt at a range of speeds is provided; also manometer indicators which permit accurate control over the gas and air admitted to the atmosphere combustion chamber. This manometer provides a record of the correct mixture for each operation and thus makes it possible to duplicate any atmosphere.

Brown Instrument Has New Pyrometer

The Brown Instrument Co., Philadelphia, is placing on the market a new null type potentiometer pyrometer, which will indicate, record and automatically control temperature with extreme precision. The prime object in the development of this instrument was to produce an extremely accurate pyrometer to meet the requirements in modern industrial practice and sufficiently rugged to withstand the severe service conditions met with in industry. The Brown potentiometer pyrometer incorporates some 53 features new to



potentiometer pyrometers, including a positive driving mechanism controlled by the galvanometer and exerting minimum force on the galvanometer pointer and a long 40" slide wire enclosed in glass and which can be immersed in oil where desired for protection from corrosive gases and vapors.

Another improvement is an automatic compensator which corrects the pen position for expansion and contraction of the chart paper with change in humidity of the atmosphere. The oblong holes in a strip chart are necessary to permit this expansion and contraction with change in humidity and this movement of the chart can cause an error of as much as 1% of full scale value if not corrected for.

Automatic temperature control is obtained through mercury switches which can handle up to 25 amperes directly, without the use of relays. The case has been so designed that the instrument can be mounted on a wall, on a table, or either front-of-board or mounted on a panel board. These few examples of the new features of the Brown potentiometer indicate the care that has been taken in the design of this new instrument for accurate measurements under severe service conditions.

Ryan, Scully and Co., 3711 Wissahickon Ave., Philadelphia, recently issued a bulletin on their oil-fired, pot type furnaces.

TRANSACTIONS WILL COME IN NOVEMBER

R. T. Bayless to Edit Monthly Editions of Technical Papers

As announced in the March issue of the Review, the *Transactions* of the A. S. S. T. will again be published as a monthly magazine, beginning with the issue dated November, 1931. This follows the action of the Board of Directors at their meeting on Feb. 18, 1931. Ray T. Bayless, assistant secretary of the Society in charge of technical activities, will edit *Transactions*, a task he has held since 1922. Mr. Bayless is secretary of the Publication Committee.

Transactions will be printed in a size 6 by 9 inches over all, the size in which it formerly appeared. It will contain reprints of all the technical papers appearing on the A. S. S. T. programs of the National Metal Congress, complete with discussions, and will also publish other papers which the Publication Committee believes to have sufficient merit to be presented to members of the Society through *Transactions*.

Every member will receive a copy of the monthly *Transactions* as one of the services of the Society and at no additional cost. *Metal Progress* and the Review will continue to be issued monthly by the A. S. S. T., providing a triad of monthly publications in no way overlapping and each essential to the greatest benefit of the membership.

RESERVE HOTEL ROOMS NOW! Hotels Statler and Copley Plaza in Boston to be Filled by Metal Men

Hotel Statler in Boston, headquarters of the A.S.S.T., A.I.M.E., A.S.M.E., and S.A.E. during the National Metal Congress and Exposition the week of Sept. 21, urges that reservations for that week be sent in at once because thousands of metal men and their families are expected in Boston that week for the Congress and Exposition.

Similar admonitions have been received from officials of the Copley Plaza Hotel, headquarters for the American Welding Society.

All who are planning to attend the Congress should reserve the type of room they desire at once. Address the hotels direct.

PITTSBURGH CHAPTER HAS A BIG COURSE IN METALLURGY

Lasts 15 Weeks; Starts Sept. 8

A course of 15 lectures covering almost every phase of elementary metallurgy will open in Pittsburgh Sept. 8 at the auditorium of the H. C. Frick Teacher Training School, Oakland district. The course is sponsored by the Pittsburgh chapter of the A.S.S.T.

Lectures will be held weekly on Tuesday evenings until Dec. 15. Such well-known men as Dr. C. H. Herty, Jr., E. G. Hill, J. Spotts McDowell, S. L. Goodale, V. N. Krivobok, Norman Wolman, N. I. Stotz, James A. Succop, J. P. Gill, James Aston, and R. L. Templin have agreed to present lectures.

Ten dollars will be charged for the course and an enrollment of 350 is anticipated. S. L. Goodale, University of Pittsburgh, is chairman of the chapter's educational committee which is planning the course. Other members are E. H. Dix, Jr., A. D. Beeken, C. H. Herty, Jr., W. H. Phillips, Jerome Strauss, J. A. Succop, and H. R. Wade.

COMPLETES 300,000 "MIKES"

E. Leitz Co. Dedicates Instrument to Physician, Following Old Custom

The optical works of E. Leitz in Wetzlar, Germany, have completed their 300,000th microscope. This instrument was presented at an appropriate gathering to Geheimrat Professor Dr. Ludwig Aschoff of Freiburg in Breisgau, Germany, a scientist and physician of world renown in the pathological and anatomical field of scientific endeavor.

The dedication of this microscope follows a custom of the firm of E. Leitz to present every 50,000th microscope to an outstanding scientist or institute, thus expressing their appreciation for the cooperation extended by leading authorities to the Leitz Works.

The names of the institutions and scientists who have received the previously awarded microscopes are: German Tuberculosis Sanatorium in Davos, Switzerland; Dr. Robert Koch, Berlin; Dr. Paul Ehrlich, Frankfurt; Dr. Martin Heidenheim, Tübingen; Institute for Tropical Hygiene, Hamburg.

A bulletin describing the newer types of welding rods and equipment is available from Joseph T. Ryerson and Son, Inc., Chicago. Ask for Bulletin "W".

Composite Carbon, Alloy Steel Made

Industrial Welded Alloys, Inc., 225 Broadway, New York, have perfected Plykrome, a composite metal in which stainless steel is veneered and completely welded-bonded to a mild steel billet and then rolled on a mill to form an integral plate or sheet. The organization holds a basic patent on the protection of ordinary steel with a thin integral surface of chromium alloy, and has complete process patents now pending.

To make Plykrome a plate of stainless alloy of predetermined thickness is first welded by a special process to the billet or bloom of steel. Welding the perfect and ductile bond necessary to join the entire area of one surface of the alloy plate and the mild steel billet requires the prevention of oxidation and a controlled welding temperature which is effective with the alloy but not harmful to the steel.

The welded billet is then rolled into plates, bars or sheets according to usual mill practice. The surface can be sand blasted, pickled or polished as desired. Equipment fabrication is to be done exclusively at the Industrial Welded Alloys plant, following the special alloy arc welding process developed by the company for handling chromium-nickel steels, and the recognized practice for welding the mild steel backing.

The composite metal has been made with all of the well known makes of stainless alloy and of any required analysis. Thickness of the veneer and of the backing plate can be varied almost at will. One series of tests showed that while the total thickness of the plate was increased 7% when the alloy veneer was applied, the ultimate strength was increased 25%. The composite can be bent 180 degrees, drawn, spun or flanged without cracking or parting the alloy from the steel.

Primary uses are to prevent corrosion and oxidation of exposed parts without making those parts entirely from alloy steel. Maximum economy of alloy is claimed.

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Problems Like These Interest The Men In Booth A-6



In the early days of aviation....a builder of aeroplane engines faced a difficult problem....shop production of cylinder sleeve barrels was only three an hour. Slow machining....troublesome grinding....high shop losses....and plane builders calling for engines. Where was the trouble? In the steel? In heat treating? In machining? In grinding? Republic Metallurgists studied the problem....and developed a special analysis steel requiring only normalizing....quenching was eliminated....a change was made in Brinell specifications....a formed forging replaced an extruded one. Result? A better sleeve barrel and production jumped to seventeen an hour.



An automobile manufacturer was suffering severe production losses from "hard spots in the steel". Again Republic Metallurgists stepped in. A careful check of the steel....physically....chemically....microscopically. Then a study of forging operations....without results. The steel was sound, free from inherent defects and suitable in analysis and physical properties....forging practice was perfect. In an oil fired heating furnace, Republic Metallurgists found the trouble....poorly placed burners....imperfect combustion....unconsumed carbon in the oil forming a small coke residue and falling on the forgings, creating a carburizing effect. The furnaces were redesigned, burners improved and relocated....and hard spots became one of yesterday's troubles.

Helping the steel user select the proper analysis for the job....aiding in the efficient handling and heat treatment of alloy steels....tracing trouble in the production of alloy steel parts....helping fabricators to cut costs by developing better methods of polishing stainless steels....assisting them on die clearances....co-operating with them in the selection of shop equipment....these are every-day jobs for the Republic Metallurgists you will meet in Booth A-6. They are always glad to discuss steel troubles and you'll find it's the perplexity of the problem rather than the size of your requirements that interests them.



Data of help to every buyer and user of alloy steels is contained in the new edition of the Agathon Alloy Steels Handbook. Write for a copy.

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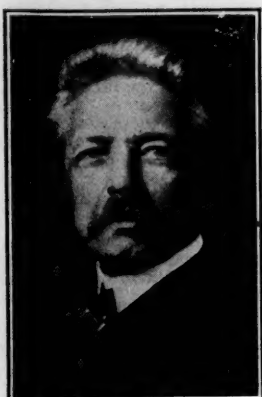
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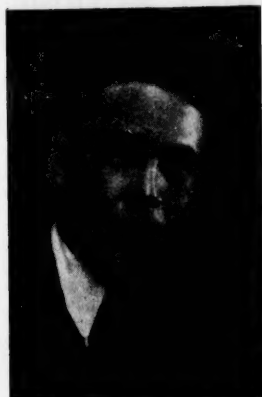
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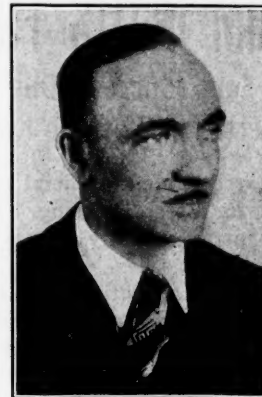
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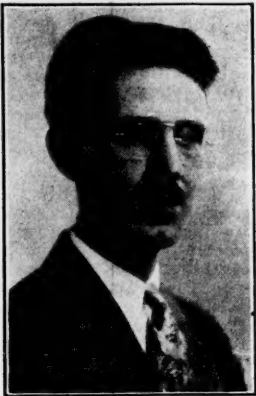
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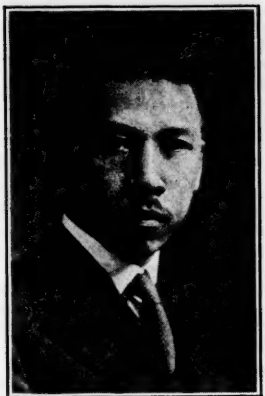
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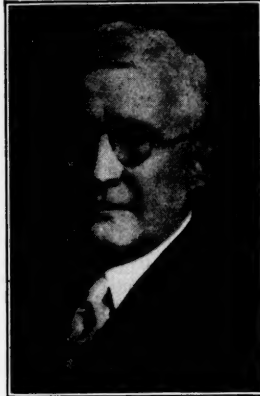
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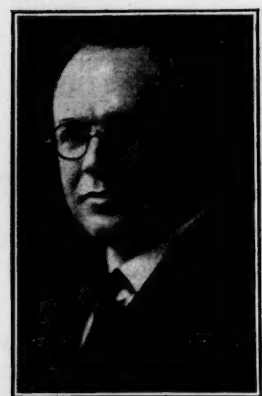
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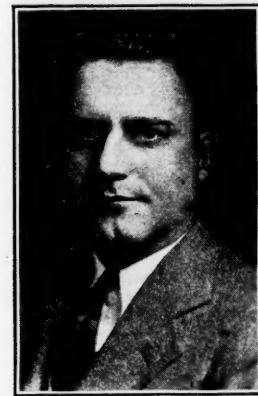
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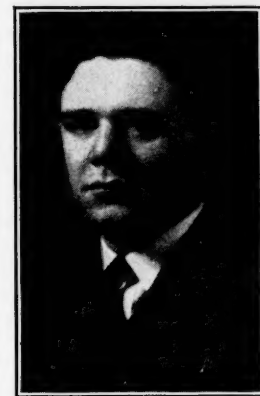
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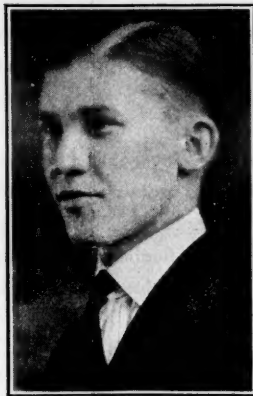
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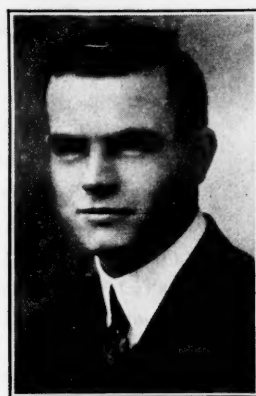
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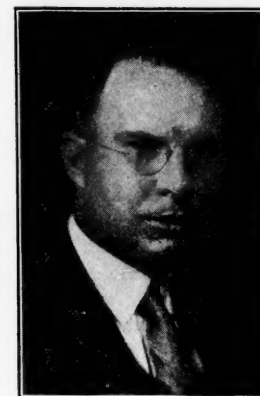
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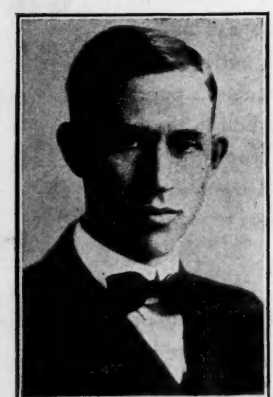
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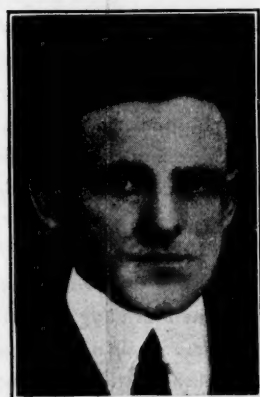
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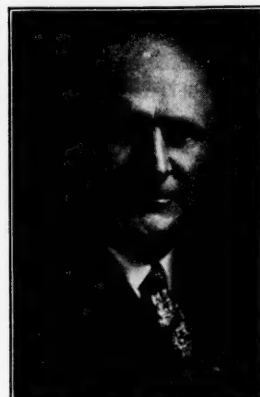
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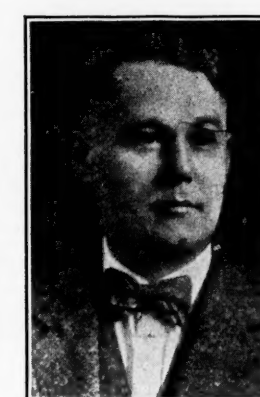
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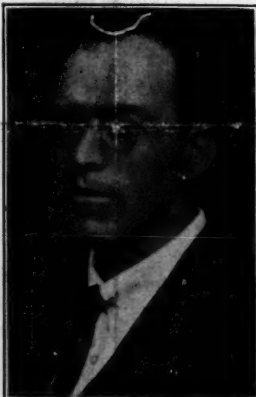
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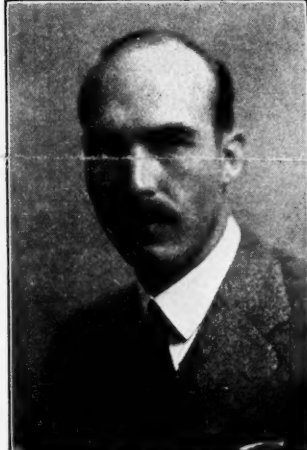
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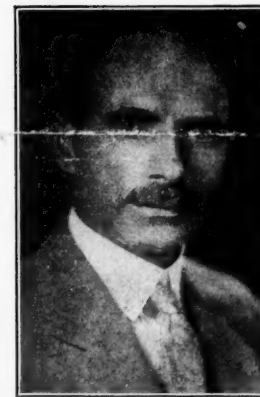
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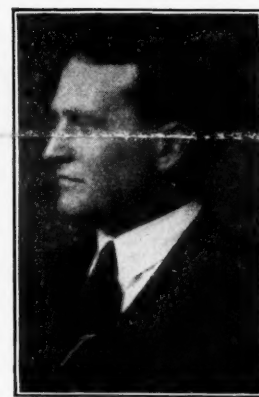
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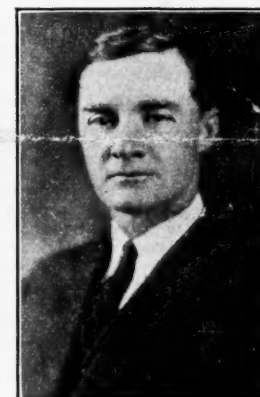
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H. G. KESHIAN



HAAKON STYRI



G. A. DORNIN

EXHIBITING FIRMS, 1931 NATIONAL METAL EXPOSITION

Achorn Steel Co., Boston. Booth C-321.

Exhibiting: Best carbon steel; Standard carbon steel; Superior oil hardening steel; Fagersta steels; chisel steel; cutlery blade steel; cold heading die steel; envelope die steel; fast finishing steel; forgings—carbon and oil hardening steel; high carbon high chrome; hot die steel; Kloster Prior extra cobalt high speed steel; mining drill steels, solid and hollow; overcoat axe steel; self hardening steel; special alloy die steel; spring steel, bars and sheets; Swedish (Norway) iron; shoe die steel; tack die steel; tool bits; unbreakable chisel steel; wire drawing die steel; Wite-Gold steel; Dora Wolfram N N. Also tools and dies made from Fagersta steels.

In attendance: Leon A. Achorn, Colin G. Hoyland, Robert Ross, Reuben MacCourt, Arthur S. Johnson, Daniel S. Sullivan, Walter Larsson, Floyd P. Meyer.

Air Reduction Sales Co., New York. Booth A-109, 111, 115, 117.

Exhibiting (in operation): The No. 2 tube welding machine for oxyacetylene welding, particularly adapted to the mechanical welding of tubes from 1 1/4 to 4 in. in diameter, having wall thicknesses up to 3/8 in. The outstanding features of its design are the overhung mounting of the rolls, facilitating quick changes of the roll equipment; and, water cooling of the bearings exposed to heat. Equipped with a universal torch adjusting arm and using the latest developments in tip design and welding technique, this machine is capable of producing quality tubing at the speeds required for modern economical tube production. Airco-D-B No. 4 Oxygraph will also be shown equipped with four machine cutting torches and remote control apparatus which enables the operator to light each torch, turn on the oxygen cutting jets and to produce four cut shapes simultaneously. Also on demonstration will be the Airco-D-B hand welding and cutting equipment.

In attendance: J. L. Anderson, manager research engineering department; H. J. Grow, assistant manager, research engineering department; W. H. Ludington, manager applied engineering department; R. F. Helmkamp, engineer; G. F. Wieser, engineer; LeRoy Edwards, engineer; G. Van Alstyne, advertising manager; J. F. Callahan, advertising assistant; W. W. Barnes, manager Philadelphia district; J. N. Harkins, manager Boston district; F. B. Mehaffey, assistant manager, Boston; G. Jaeger, sales representative, Boston; R. B. Brown, sales representative, Boston; P. Magee, sales representative, Boston; G. F. Mehaffey, sales representative, Boston; W. F. Barron, supervisor, Boston; G. Stewart, serviceman, Boston.

Ajax Electrothermic Corp., Trenton, N. J. Booth B-269.

Exhibiting: One 1000-lb. Ajax-Northrup coreless induction furnace; one 17-lb. Ajax-Northrup high frequency induction furnace; photographs of Ajax-Northrup furnace installations; sample castings made by our customers in our type furnaces.

In attendance: G. H. Clamer, president; Dr. E. F. Northrup, vice president and technical adviser; Dudley Wilcox treasurer and assistant general manager; Robert N. Blakeslee, Jr., secretary and sales manager; A. D. Meyer, sales metallurgist; H. G. Remmers, electrical engineer; F. T. Chesnut, electrical engineer.

Allegheny Steel Co., Brackenridge, Pa. Booth A-2 and B-31.**American Brass Co., Waterbury, Conn.** Booth C-131.

Exhibiting (in operation): Demonstrations of oxy-acetylene welding with Tobin Bronze rods. Charles Gallo, a leading authority on bronze welding, will have charge of the welding demonstrations and will instruct visitors in the proper methods of oxy-acetylene welding with Tobin Bronze. In addition, there will be displayed a collection of cast iron pieces repair welded with Tobin Bronze filler rods. Everdur metal, a copper-silicon-manganese alloy, weldable by all methods, will be shown in sheet, wire, rod, tube and cast forms. There will also be a display of Everdur tanks constructed by automatic electric welding.

In attendance: W. Harold Dowd, in charge.

American Car and Foundry Co., New York. Booth A-225.

Exhibiting (in operation): An a.c.f. Berwick electric rivet heater, for heating rivets, and an a.c.f. Berwick electric metal heater, for heating stock for forging or upsetting.

In attendance: F. C. Cheston, sales agent; John S. Helt.

American Cyanamid Co., New York. Booth B-28.

Exhibiting: Literature describing Aceorcase process and exhibition of various parts treated by this method of case hardening.

In attendance: W. T. MacAdam, E. C. Moffett, P. E. Holder, G. D. Johnston.

American Electric Furnace Co., Boston. Booths C-302-304 and X-11.

Exhibiting (in operation): Juthe pre-heating and high speed gas furnaces with patented atmospheric control; American electric pre-heating and high speed furnace with patented atmospheric control; American electric Airtemp furnace; American electric Nitro furnace; Juthe gas furnace; American electric pot and box furnaces.

In attendance: Kristian A. Juthe, president; Stanley N. Juthe, vice-president; J. C. Juthe, sales manager; A. J. Hanson, chief engineer; L. A. McCalla, manager Detroit district; A. B. Beach, manager Cleveland and Pittsburgh districts; C. E. Barba, manager Philadelphia and New York districts; A. L. Smith, manager Hartford district; A. D. Heath, manager Indianapolis district.

American Gas Association, New York. Booth, Gas Section.**American Gas Furnace Co., Elizabeth, N. J.** Booth, Gas Section.**American Instrument Co., Washington, D. C.** Booth A-16.

Exhibiting (in operation): New Aminco metallographic polishing machine for the preparation of metallographic specimens for microscopic examination. Machine polishes three specimens simultaneously, is entirely automatic, and produces a finish that approaches optical perfection. Tuckerman optical strain gage for measuring strains in specimens under tension or compression either hot or cold. Gage measures to a high degree of accuracy displacements as small as 2/1,000,000 of an inch per inch of gage length. This instrument will be of particular interest to those contemplating research on the tensile strength, elastic limit, elongation, creep stress, etc. of the newer heat resisting alloys.

In attendance: William H. Reynolds, engineer.

American Manganese Steel Co., Chicago Heights, Ill. Booth A-22.**American Metal Market, New York.** Booth D-83.

Exhibiting: Daily newspaper of the iron, steel and metal industries.

American Steel & Wire Co., Chicago. Booth B-119.

Exhibiting (in operation): Premier welding wire for gas and electric welding. Actual welding demonstrations will be carried on. Also samples of cold rolled strip steel, cold drawn steel bars and stainless and heat resisting steels.

In attendance: F. Connell, E. C. Boote, H. M. Francis, C. J. McGregor, W. E. Mackley, G. S. Rose, C. W. Whiting, F. T. Clarke, H. C. Pearson, A. N. Murdock, F. Beckendorf.

Andresen and Associates, Inc., F. C., Pittsburgh. Booth B-258a.**Armstrong-Blum Mfg. Co., Chicago.** Booth B-266.**Armstrong Cork & Insulation Co., Lancaster, Pa.** Booth B-256.

Exhibiting: Armstrong's insulating brick, Nonpareil insulating brick, calcined earth (for concrete and fills) Armstrong's high pressure block, Armstrong's high pressure covering, diatomaceous earth (powder), finings cements. Special shapes of the above materials, such as the dome block; exhibit of other products of the Armstrong Cork Company, which are nationally known but little related to the steel industry.

In attendance: S. M. Jenkins, assistant sales manager; C. A. Senter, sales representative, New York office; N. L. Withington, manager sales promotion.

Associated Alloy Steel Co., Inc., Cleveland. Booth B-51.

Exhibiting: Interesting articles manufactured from our Nevastain and Nitralloy materials.

In attendance: D. B. Carson, vice president in charge of sales; H. A. De Fries, chief metallurgical engineer; C. B. Boyne, assistant sales manager; J. E. Polhemus, Detroit district manager; Geo. F. Wilson, Philadelphia district manager; P. L. Coddington, New York district manager; R. P. McCarty, New England district manager; P. E. Floyd, Chicago district manager; A. N. Vogt, Cleveland district manager; W. L. Weaver, Albany district manager; W. Kinsey, Cincinnati district manager.

Atkins and Co., E. C., Indianapolis. Booth A-229.

Exhibiting (in operation): Atkins Silver Steel hack saw blades in use on Atkins Kwik-Kut power hack saw machines. Atkins AAA alloys steel bandsaws in use on Atkins No. 4 metal bandsaw machine. Atkins circular metal cutting saws. Atkins machine knives, Atkins wood-cutting saws. Atkins hacksaw frames.

In attendance: Edwards S. Norvell, assistant general sales manager; E. W. Clark, manager Eastern branch; J. I. Kip, New England representative; J. A. Hamlin, New England representative; A. W. Gadd, New York representative.

Automatic Temperature Control Co., Inc., Philadelphia. Booth B-258.

Exhibiting (in operation): A new three-position controller for continuous furnaces where sudden fluctuations occur and where the average load changes considerably. Also an improved two motor; balancing controller particularly adapted to large tunnel kilns, etc. Also a compact, single valve, two position control with interesting features.

Baldwin Southwark Corp., Philadelphia. Booth B-47.

Exhibiting (in operation): One 60,000-lb. Southwark-Emery universal testing machine, automatic and autographic; one 10,000-lb. Southwark-Wazau universal testing machine automatic and autographic; Foepl-Pertz damping tester; Foepl-Heydekampf fatigue tester; Wazau sheet metal tester; Wazau Brinell tester; Morehouse proving rings; Peters electric telemeter; Huggenberger tensometer; Whittemore strain gauge; Lehmann indicators; Geiger vibrograph and torsigraph; Moore extensometer.

In attendance: F. G. Tatnall, manager testing equipment division; F. Buckingham, sales engineer; Dr. G. S. von Heydekampf, research engineer.

Bastan-Blessing Co., Chicago. Booth C-144.

Exhibiting (in operation): Standard oxy-acetylene gas welding and cutting unit for production light welding; production pipe welding, maintenance cutting and welding and salvage cutting with gas. Also high speed production brazing operation. An example of actual work done by a Rego customer. A prize-guessing contest will be operated in connection with this part of the exhibit. Free tickets will be given to each visitor at the booth. The most accurate guess will receive a choice of several different welding torches.

In attendance: Earl M. Evleth, engineer; Harris A. Goodwin district sales manager.

Bausch and Lomb Optical Co., Rochester, N. Y. Booths C-69 and C-71.

Exhibiting (in operation): Large metallographic outfit; quartz spectrograph; contour measuring projector; industrial microscopes; smaller tools for industrial purposes. In attendance: I. L. Nixon, sales manager, industrial sales division; Paul Hayes, New England sales representative; C. Nitchie, sales engineer; J. A. Scheick, sales engineer.

Bethlehem Steel Co., Bethlehem, Pa. Booth B-39, 41.**Biax Flexible Shaft Co., Inc., Long Island City, N. Y.** Booth B-275.

Exhibiting (in operation): Small tools for grinding, drilling, buffing, filing, etc.

In attendance: R. Wezel, president; F. J. Vander Beek, Jr., vice president; A. A. Ekins, representative.

Botfield Refractories Co., Philadelphia. Booth B-260.**Brassett & Co., H. A., Chicago.** Booth D-158.

Exhibiting (in operation): One Askania Constant Pressure Regulator for maintaining a constant pressure in a gas main; one Askania Ratio Regulator for mixing fuel gas with the proper amount of combustion air; one Askania

Continued on Page Six

AJAX

NORTHROP

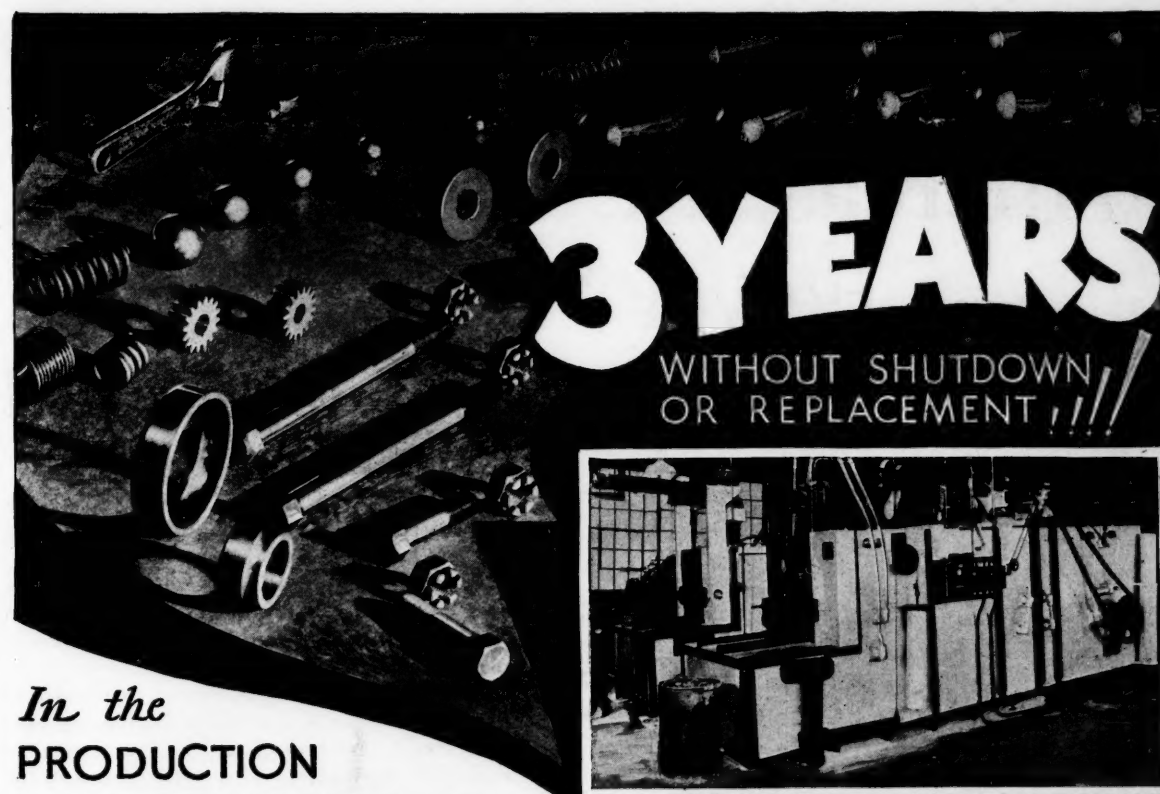
CORELESS INDUCTION FURNACES

for

SUPERIOR STEEL MELTING

VISIT SPACE B-269

AJAX ELECTROTHERMIC CORPORATION
TRENTON, NEW JERSEY



In the PRODUCTION HEAT TREATMENT OF MISCELLANEOUS PRODUCTS

Over 3 years continuous service without a replacement of any kind . . . without a dollar spent for repairs . . . without loss of production or a shut down for any furnace trouble whatever . . . and still going strong. That, briefly, is the story of a continuous chain belt conveyor furnace (with belt 36" wide) installed February, 1928. They're continuous in service as well as operation.

Over 50 installations of these rugged continuous furnaces, handling products ranging in size from small nuts and bolts to large crawler links for tractors, have proven them the most satisfactory machines built for the uniform, economical, production heat treatment of miscellaneous small and medium size products.

Built for oil, gas or electric heat in sizes to fit any production requirement.

Send for illustrated bulletin and list of products handled . . . investigate these furnaces for handling your products . . . ask for Bulletin No. 4-30.

Ask for illustrations and list of recent installations.

The above illustration shows 2 continuous chain belt conveyor furnaces, heating and automatically quenching bearing races.

We build Oil, Gas and Electric Furnaces and Kilns of every type and for every heating process.

Recent installations include:
Annealing Pits
Bright Annealing Retorts
Ceramic Kilns
Continuous and Batch type furnaces for:
Normalizing
Billet Heating
Nitriding
Forging
Hardening and Drawing
Tube Annealing
Carburizing
Enameling
Plate Heating
Etc.

THE ELECTRIC FURNACE CO.
SALEM, OHIO.

Fuel Fired Furnaces

Electric Furnaces

FIRMS IN EXPOSITION

(Continued)

Central Oil Pump for operating the regulators; Regulating Cylinders for operating the valves; pressure gauges; volume indicating gauges; Minimeters; one Bourdon Tube Regulator for high pressure.

In attendance: W. H. Monahan and Hubert Velten, engineers.

Bristol Co., Waterbury, Conn. Booth B-32 and C-61.

Brown Instrument Co., Philadelphia. Booths D-76 and D-78. Exhibiting (in operation): The new Brown potentiometer pyrometer. Parts and assemblies of this new instrument, together with indicating, recording and automatic control models in operation, will be shown. Engineers will be on hand to demonstrate the new features claimed for this potentiometer. Also to be shown are Brown pyrometers of the millivoltmeter type; Brown CO₂ meters for indicating and recording % CO₂ in flue gas; Brown flow meters for indicating, recording, integrating and automatically controlling flow of steam, water, air, gas or oil; Brown thermometers for temperatures below the usual pyrometer range; gauges for measuring pressures and liquid levels; Brown tachometers for measuring rotating belt speed; Brown flame analyzer for checking heating effect of gaseous fuels; and Brown remote control instruments for indicating, recording and controlling distant processes, or the position of distant control members.

In attendance: G. W. Keller, vice president and general sales manager; H. M. Schmitt; A. R. Ullman; George P. Beck, district manager; A. S. Richards, R. W. Crosby, R. R. Little, Boston office; M. M. Watkins, district manager, N. Y. office.

Brown Wales Co., Boston. Booth A-23.

Exhibiting: Elastuf Type A heat treated machinery steel and finished machine parts. Elastuf Penn machinery steel and finished parts. Other warehouse grades of quality steels for machine parts. Hard facing welding rod.

In attendance: Chapin E. Harris, general manager sales; Thos. G. Breen, sales metallurgist; Arthur L. Collins, manager alloy steel division; Robert L. Brownell, Maine representative; all salesmen at various times.

Carboloy Co., Inc., Detroit. Booth C-136.

Carborundum Co., Niagara Falls, N. Y. Booths B-263, 265. Exhibiting (in operation): Abrasive materials, grinding wheels, abrasive grain, abrasive disks. A number of refractory materials including bricks, tiles, muffles, cements and a model recuperator. The Global Corp. will exhibit Global electric elements operating in two heat treating furnaces.

In attendance: S. F. Courter, sales manager, Niagara Falls; J. E. Razner, district sales manager, Boston; C. E. Hawke, sales manager, refractory division, Perth Amboy.

Carborundum Co., Perth Amboy, N. J. Booth B-263. Exhibiting: Carbofrax and Aloxite brand brick, tile, special shapes and high temperature cements utilized extensively throughout the metallurgical industries. Complete section of a Carbofrax muffle furnace for heat treating alloy steel.

In attendance: C. E. Hawke, general sales manager; J. A. King and F. W. Miller, sales engineers.

Carpenter Steel Co., Reading, Pa. Booth C-58.

Exhibiting: Carpenter Special and Extra water-hardening and Stentor oil-hardening tool steels. "Timbre Testing" and "Hot Acid Etch Testing" as employed in our inspection will be featured in connection with these steels. Carpenter stainless steels, as manufactured in our mills, and articles made of these materials.

In attendance: F. R. Palmer, assistant to president; G. V. Luerssen, metallurgical department; O. V. Greene, metallurgical department; G. H. Edmonds, sales department; W. M. Loos, sales department; C. W. Olsen, district sales manager; J. M. Millard, W. F. Rossiter, S. C. Shapleigh and L. F. Ward, sales representatives.

Chemical Catalog Co., Inc., New York. Booth A-1.

Chicago Steel Foundry Co., Chicago. Booth D-85.

Exhibiting (in operation): Pyrasteel, heat resisting alloy in various grades. Evansteel, abrasion resisting alloy, representing castings in both grades, and cast steel helioid screw conveyors. One pyrasteel helioid screw conveyor operating.

In attendance: David Evans, president; A. F. Steen, engineer; George M. Jeffery, New York representative.

Climax Molybdenum Co., New York. Booth B-44.

Exhibiting: Samples of molybdenum in various forms as used by industry.

In attendance: H. L. Brown, general manager; J. B. Thorpe, assistant to president; Alan Kisson, vice president; W. P. Woodside, Detroit representative; J. Kent Smith, consulting metallurgist.

Cling-Surface Co., Buffalo. Booth C-62.

Exhibiting (in operation): Two belt-driven rotary pumps driven from a common shaft by a 7½ h.p. motor comparing the efficiency of the pump driven by the belt treated with Cling-Surface and running slack and the one driven by the untreated belt. The pumps are so mounted that the tension on the belts can be varied and read directly by means of spring scale attachments showing actual tension on the belts. The work which the pump is doing is indicated by the pressure gauge attached to each respective pump and a corresponding tachometer showing variations of speed as the load increases.

In attendance: G. N. Parker, vice-president and W. F. Laufert, New England sales representative.

Crucible Steel Co. of America, New York. Booths B-38, 40.

Exhibiting: Noncorrosive materials of various kinds, showing the forming, welding and finish of our corrosion resistant steels will be on display, also actual demonstration of the welding of these materials. Finished high speed and alloy tools of various kinds. Samples of nitrided work of different characters.

In attendance: F. B. Hufnagel, president; Dr. J. A. Mathews, vice president; A. T. Galbraith, vice president; R. E. Christie, assistant general sales manager; E. P. Gaffney, R. H. Heatley, J. P. Morrissey, A. H. Birnbaum, New York; W. P. Knecht, manager, S. H. Reynolds, J. A. Ricard, H. L. Johnson, W. E. Gardner, A. F. McClean, W. H. McDonald, Boston; F. J. Dawless, manager, New Haven; E. M. Murphy, manager, Springfield; and O. W. Geer, manager, Providence.

D. A. Stuart and Co., Chicago. Booth A-216.

Exhibiting (in operation): The new D. A. Stuart and Co. high load carrying capacity lubricating oils and greases for industrial and automotive requirements. The much discussed Timken Lubricant Testing machine will be in operation daily and frequent tests will be run checking the lubricity of unidentified lubricants that visitors are invited to furnish. In addition to the above there will be a display of various metal parts manufactured of stainless and other alloy steels such as S.A.E. 6150. These parts are particularly interesting as they demonstrate the smooth finish secured and the comparatively easy machineability made possible by the use of the D. A. Stuart & Co. metal working oil products developed especially for such conditions. A display of Sturaco high load carrying capacity oils and greases for severe conditions such as high loads, high temperatures and high rubbing speeds will also be featured.

In attendance: C. I. Grierson, president; T. B. Langdon, director of sales; W. H. Oldacre, director of engineering and research; A. J. McDuff, New England manager; A. S. Hull, Philadelphia manager; G. A. Dudley, New York State manager.

Dearborn Chemical Co., Chicago. Booth C-300.

Exhibiting: No-Ox-Id Master Coat and its individual constituents composed of Milcoat (No-Ox-Id protective coating 2C black), No-Ox-Id G Special, No-Ox-Id-Ized gray fabric wrapper, and No-Ox-Id service coat; Dearborn cleaners (liquid and powdered).

In attendance: C. A. Remsen, Eastern manager of department of specialties; J. S. Kelley, special representative.

Dow Chemical Co., Midland, Mich. Booth D-94.

Exhibiting: The available forms of magnesium-base Dowmetal alloys and will show representative castings, forgings, extruded products, sheet, etc. Fabricated structures, such as bus seats, etc., will also be included.

In attendance: L. B. Grant, manager of Dowmetal sales; Dr. John A. Gann, chief metallurgist.

Driver-Harris Co., Harrison, N. J. Booth B-48 and C-75.

Exhibiting: A diversified exhibit of heat treating containers and furnace parts made of Nichrome, the original heat-resisting alloy. There will be on display carburizing boxes, both cast and sheet and also boxes combining sheet and cast parts; die cast pyrometer protection tubes; lead, salt and cyanide pots; dipping baskets; trays, rollers, fixtures and other furnace parts; bolts and nuts; retorts, mufflers and small intricate castings.

In attendance: F. V. Lindsey, vice-president; G. A. Lennox, assistant sales manager; J. Sammon, foundry engineer; W. E. Blythe, Detroit; J. C. Bilek, Chicago; L. V. Prior, Cleveland; J. B. Shelby, Philadelphia; A. H. Kromminga; G. M. Pinney, New York; K. H. Hobbie, Chicago; A. J. Eckley, Detroit.

Eisler Electric Corp., Newark, N. J. Booth C-140.

Exhibiting (in operation): A complete line of electric spot welding machines, ranging from ½ kva units to 20 kva. This is a new line of welders which is being introduced by us to the trade, although we have been manufacturing light type line of welders for use in radio field, incandescent lamps, etc., or wherever very fine welding equipment was desired.

In attendance: Charles Eisler, president; Kenneth P. Swanson, engineer; Michael A. Fox, booth sales representative; Joseph A. Morick, chief engineer.

E. Leitz, Inc., New York. Booth D-80 and D-82.

Exhibiting (in operation): The Leitz large Micro-Metallograph, consisting of the following: Microscope of an especially heavy design; Micrometer Screw protected from heat rays; Ingenious Optical System resulting in a micro-image flat to the utmost edge; Permanent Alignment assuring instantaneous results; Improved Illumination; New Electro-Magnetic Arclamp interchangeable with low-voltage incandescent lamp; a new series of Leitz Micro-Objectives especially constructed to render increased definition and enlarged flat field to the extreme edge; Leitz-Darkfield Device which offers a new method of examining metal specimens; Leitz Automatic Dilatometers (two distinct models) which register automatically and photographically, thermal changes of metals at temperatures approaching the viscosity border; in Grinding and Polishing Equipment there will be on display a one-spindle, two-spindle and four-spindle construction. These instruments render excellent results and eliminate the necessity of skilled operators.

In attendance: W. Zieler, technical director; R. Tvestman, factory superintendent; O. Soetbeer, technical representative.

Electro Metallurgical Sales Corp., New York. Booth B-45.

Elkon, Inc., (Division of P. R. Mallory & Co.) Indianapolis. Booth B-118.

Endicott Forging and Manufacturing Co., Inc., Endicott, N. Y. Booth C-73.

Exhibiting: Drop and upset forgings as produced for automobiles, airplanes, tractors, air compressors, railroad equipment and miscellaneous drop forgings. In attendance: S. J. Marshall, president; R. B. Baker, purchasing agent; J. C. Orr, sales engineer; C. S. Swanson, sales engineer.

Ensign-Reynolds. Booth, Gas Section. (See Page 10)

Ferner Co., R. Y., Washington, D. C. Booth A-226.

Exhibiting (in operation): Société Genevoise Swiss precision borer, Type MP-4B with inclinable rotary table. Société Genevoise Micro-Indicators and stands for inspection measurements.

In attendance: R. Y. Ferner, president; John Cetrule, New York representative; Charles T. Ameel, demonstrator; Samuel E. Kenworthy, demonstrator; Nicholas Cetrule, sales representative; Peter Muston, sales representative; C. R. Allen, New England sales representative.

Finkl and Sons Co., A., Chicago. Booth A-10.

Exhibiting: Neon lighted die block; large etch test of die block steel. Pictures of plant and equipment. Some dies that have been in production.

In attendance: J. M. Curley and H. M. Berg, eastern sales representatives; T. P. Wallace, Cincinnati office; E. H. Graham, Detroit office; H. A. Harris and W. F. Finkl, Chicago office.

Ford Co., J. B., Wyandotte, Mich. Booth A-222.

Exhibiting: Samples of specialized cleaners and alkalis in glass containers; also samples of metal parts which have been cleaned with our products after heat treating and before the many finishing operations such as plating, lacquering, japanning, assembling, etc. The exhibit also consists of glass tanks containing air agitated cleaning solutions made up with Wyandotte cleaners.

Continued on Page Seven

Increased Cutting Speeds, Prolonged Tool Life and Fewer "Rejects" with SUNOCO at the plant of the Cleveland Steel Products Corporation



Courtesy of
Cleveland
Steel
Products
Corporation,
Cleveland,
Ohio

OPERATION: TURNING, DRILLING, FACING
AND REAMING 3½ IN. FLANGE FOR UNI-
VERSAL JOINTS.
MACHINE: CLEVELAND 8 IN. CHUCKING
MACHINE.
MATERIAL: S. A. E. 1035 STEEL.
SPINDLE SPEED: 106 R. P. M.
CUTTER: 25 PIES PER HOUR.
LUBRICANT: 1 PART SUNOCO TO 12 PARTS
WATER.

Self-evident and definite advantages accompany the use of Sunoco Emulsifying Cutting Oil. Whether the work be turning, forming, reaming, hobbing, milling, grinding or one of many other difficult operations—Sunoco's service record testifies definitely to the complete satisfaction given.

In shops all over the country, every working day, Sunoco is materially increasing cutting speed, prolonging tool life, appreciably reducing the number of rejections and minimizing "time out for repairs".

If you are not already a Sunoco user, may we suggest a thorough test under your most exacting operating conditions?

This will enable you to see for yourself these advantages.

We invite you also to check its long-lasting and non-separating qualities, its properties as a refrigerant and lubricant, the larger quan-

tity of metal removed per tool grind, the smooth finish to completed part and the absence of rust and corrosion after the part has been in stock for some time.

These observations will serve as an adequate explanation as to just why Sunoco receives the whole-hearted endorsement of so many leaders in the metal cutting industry.

We cordially offer you the assistance of our engineers in securing full benefits from Sunoco. These representatives are widely experienced and their services are at your disposal.

Write to any of our branches or to our home office.

The Sun Oil Company produces a type of cutting oil to meet every metal-cutting requirement.

Write us for the revised and enlarged edition of "Cutting and Grinding Facts" just published.

SUN OIL COMPANY, Philadelphia, U.S.A.

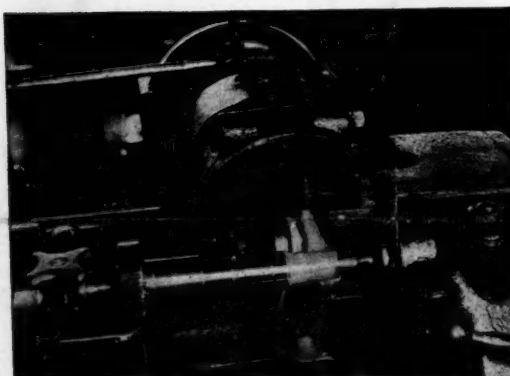
SUNOILCOMPANY, Ltd., Montreal, Canada.

SUNOCO

EMULSIFYING CUTTING OIL

Made by SUN OIL CO. producers of BLUE SUNOCO MOTOR FUEL

Courtesy of
Cleveland
Steel
Products
Corporation,
Cleveland,
Ohio

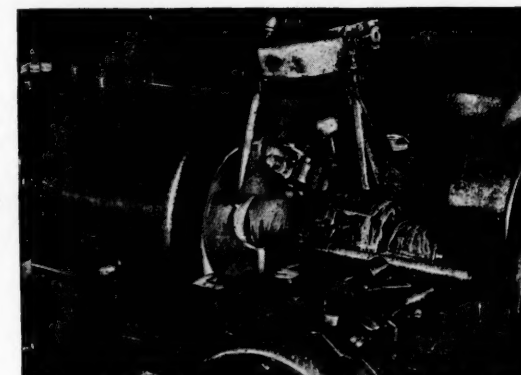


OPERATION: MILLING THREAD ON 1½ IN.
SPINE SHAFT 20 THREADS.
MACHINE: LEES BRADNER THREAD MILLER.
MATERIAL: S. A. E. 3135 STEEL.
CUTTER: 3 IN. R. P. M. 156.
PRODUCTION: 30 PIES PER HOUR.
LUBRICANT: 1 PART SUNOCO TO 15 PARTS
WATER.

Akron, Albany, Allentown, Atlantic City, Baltimore, Battle Creek, Columbus, Dallas, Dayton, Detroit, Flint, Grand Rapids, Harrisburg, Philadelphia, Pittsburgh, Providence, Reading, Rochester, Scranton, Syl-

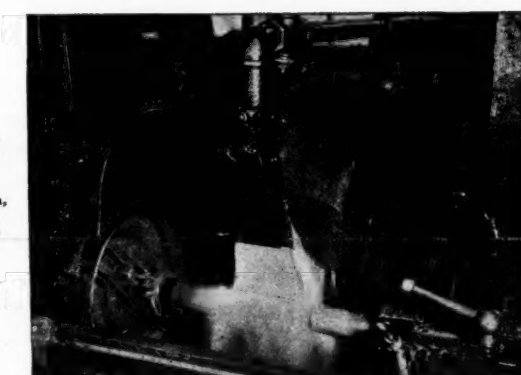
Beaumont, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Jackson, (Mich.), Jacksonville, Miami, Montreal, Newark, New York, cuse, Tampa, Toledo, Toronto, Trenton, Tulsa, Wilmington, Youngstown.

Courtesy of
Cleveland
Steel
Products
Corporation,
Cleveland,
Ohio



OPERATION: GRINDING BLEND HOLE IN
UNIVERSAL JOINT PIN.
MACHINE: HEALD 72 A 3 SIZEMATIC IN-
TERNAL GRINDER.
MATERIAL: NO. 1525 STEEL.
PRODUCTION: 150 PIES PER HOUR.
WHEEL: ½ IN. X ½ IN. X ½ IN. R. P. M. 16,500
LUBRICANT: 1 PART SUNOCO TO 50 PARTS
WATER.

Courtesy of
Cleveland
Steel
Products
Corporation,
Cleveland,
Ohio



OPERATION: GRINDING STUB SHAFT BEAR-
ING SURFACE.
MACHINE: NORTON 10 X 8 TYPE A GRIND-
ING MACHINE.
MATERIAL: S. A. E. 3135 STEEL.
WHEEL: 20 IN. R. P. M. 1100.
PRODUCTION: 75 PIES PER HOUR.
LUBRICANT: 1 PART SUNOCO TO 50 PARTS
WATER.

FIRMS IN EXPOSITION

(Continued)

In attendance: B. N. Goodell, manager, industrial department; W. M. Cole, industrial department; W. F. Cahill, industrial department; C. W. Simms, Jr., manager Boston office; J. W. English, industrial department.

Gathmann Engineering Co., Baltimore. Booth D-91.

Exhibiting (in operation): A half section of a fully-deoxidized, low carbon ingot produced in a Gathmann big-end-up mold, with analysis. A model of a new type stripper for big-end-up ingot production—designed especially for non-sinkhead ingots.

In attendance: Emil Gathmann and others.

General Alloys Co., Boston and Champaign, Ill. Booths B-26 and C-55.

Exhibiting: Nickel-chromium alloy, Q-Alloys; carburizing and annealing containers; cyanide and lead pots; furnace hearths, roller rails, heat and acid resisting chain, cyanide dipping baskets, recuperators, miscellaneous furnace parts, parts for every type heat treating furnace—carburizing, annealing, normalizing, hardening, tempering, forging, spheroidizing, tubes and retorts.

In attendance: H. H. Harris, president; W. K. Leach, vice president; G. C. McCormick, vice president; F. J. Blaney, general superintendent; W. R. Blair, assistant chief engineer; R. Hare, Hartford; R. M. Kirk, New York; E. R. Dougherty, Chicago; J. J. Donovan, Chicago; Edw. W. Voss, C. P. Mills, Pittsburgh; A. L. Gunnell, Detroit.

General Electric Co., Schenectady. Booth B-126 and C-139.**General Electric X-Ray Corp., Chicago.** Booth C-63.

Exhibiting: New X-ray diffraction equipment for the production of diffraction patterns for the determination of the effect of the working of metals and heat treatments. An extensive exhibit of diffraction patterns showing these various effects; also a display of radiographs exhibiting the various imperfections that occur in many of the fabricated methods, such as welding, assemblies and foundry practices, etc.

In attendance: E. W. Page, in charge, and Roy Dent of Chicago; Joseph Roderick, manager of Boston office; W. I. Brown, J. O. Connolly, E. F. Drew, J. R. Elliott, Nat. Vadalá, J. W. Moulton, O. Benson, E. A. Crabtree, G. R. Harlow, C. R. Kelleher, all of Boston.

General Welding and Equipment Co., Boston, Mass. Booths C-146 and C-148.

Exhibiting (in operation): Automatic shape cutting machines (oxy-gas), oxy-gas welding and cutting equipment (portable).

In attendance: Thomas F. Stoddard, president; Dr. A. Krebs, treasurer; Carlos Krebs, Daniel A. Lee, J. C. Marchant, Rexford B. Gupitell.

Global Corp., Niagara Falls, N. Y. Booth B-263, 265.**See Carburetor and Co.****Halcomb Steel Co., Syracuse, N. Y.** Booth C-65.

Exhibiting: High speed and tool steels; corrosion and heat resisting alloy steels; electric furnace alloy steels. An aircraft engine will be in operation within the booth.

In attendance: H. A. Pardee, general manager; R. H. Dougherty, assistant to the president; H. J. Stagg, assistant manager; H. L. Day, metallurgist; J. T. Leyden, assistant metallurgist; Rinehart Schemp, assistant metallurgist; Harold Barlow, Leslie Hawkridge, Clayton Hawkridge, H. D. Evans, Harold Evans, Lee Evans.

Hayes, Inc., C. I., Providence. Booth C-319. (see page 10)**Haynes Steel Co., Kokomo, Ind.** Booth C-138.

Exhibiting (in operation): Metal cutting tools of Haynes Steelite, a non-ferrous alloy, consisting chiefly of cobalt, chromium and tungsten. These tools are practically as hard at a red heat as when cold and operate most efficiently at speeds which will generate high temperatures on the cutting edge. These tools are supplied in various standard sizes and shapes. Haynes Steelite in the form of welding rod is used for hard facing surfaces of parts subjected to abrasive wear. Haysteelite, a cast tungsten carbide used as a diamond substitute for hard setting oil well drilling tools. This product is supplied in six different uniform sizes and shapes. Haysteelite composite rod, a welding rod consisting of a tough steel binder and crushed Haysteelite uniformly distributed throughout the rod. These rods are used for hard facing oil well drilling tools and wearing parts subjected to extreme abrasive wear. Hascrome welding rod, a self hardening rod used for building up badly worn machine parts to practically the original size preparatory to the application of a hard facing surface of Haynes Steelite or Haysteelite composite rods. Hastelloy, a new acid resistant alloy supplied in three grades in the form of castings, tubings, sheets, rods and other shapes suitable for parts subjected to acid corrosion. Methods of application of Haynes Steelite, Hascrome, Haysteelite and composite rods will be demonstrated daily or upon request by visitors.

In attendance: A. V. Harris, eastern district sales manager; Arthur Gray, sales representative; G. E. Wilson, sales representative.

Henshaw & Co., R. M., Boston. Booth, Gas Section.**Heppenstall Co., Pittsburgh.** Booth B-46.

Exhibiting: A booth to be used as headquarters for customers and friends.

In attendance: C. W. Heppenstall, president; B. B. Weinberg, vice president; A. J. Porter, Jr., sales manager, Bridgeport plant; C. J. Sauer, manager, Bridgeport plant; R. T. Porter, superintendent heat treating, Bridgeport plant; J. A. Succop, metallurgical engineer.

Hevi Duty Electric Co., Milwaukee. Booth B-264.

Exhibiting (in operation): Electric vertical carburizing furnace with complete temperature control apparatus and using Carbonal, the liquid carburizing medium; small box type furnace with electro-magnetic winding for determining the AC₁ point of steel; small tool room box furnace; automatic temperature control instrument for protecting furnace temperatures up to 3000° F.

In attendance: W. B. Cooley, sales manager; E. G. Craig, district manager, New York; B. H. Parker, Boston representative; L. W. Hayden, district manager, Philadelphia; J. S. Ayling, Cleveland representative.

Hollup Corp., Chicago, Brooklyn. Booth C-142.**Hones, Inc., Baldwin, Long Island, N. Y.** Booth, Gas Section.

Exhibiting (in operation): Buzzer gas fired burners and appliances; furnaces for melting soft metals, etc.; furnaces for heating soldering irons; bench furnaces for heat treating smaller parts, tools, etc.; gas burners for use in core ovens, jannepaning and enameling ovens, annealing and other industrial operations. Burners will include the ring burners, pipe burners, nozzle type of burners, all will feature the Buzzer Venturi air mixers. Immersion type heating tank for solutions, cleaning, etc.

In attendance: Charles A. Hones, president; William R. Hones, vice-president; Charles J. Hones, secretary; M. O. Koontz, superintendent; B. L. Finn, Chicago representative; Porter Hurd, Philadelphia representative.

Houghton & Co., E. F., Philadelphia. Booth A-14.**Illinois Steel Co., Chicago.** Booth C-52 and D-79.**Illinois Testing Laboratories, Inc., Chicago.** Booth C-57.**Illinois Tool Works, Chicago.** Booth B-277.

Exhibiting: High speed steel milling cutters; hobs and special metal cutting tools. Wedge-Lock tool holders, boring bars, Grippits and production vises.

In attendance: Harold C. Smith, president; F. W. England, vice-president; C. G. Olson, vice-president; C. L. Johnson, secretary and treasurer; P. J. Nelson, sales manager; S. O. Bjornberg, A. W. Swanson and T. R. Sanders.

Industrial Welded Alloys, Inc., Newark, N. J. Booth B-262.

Exhibiting: Pykrome, the new bi-metal having a surface of stainless alloy weld-bonded and rolled to a backing of mild steel. Tests will show the nature of its structure and its ability to withstand oxidation. There will also

be an exhibit of special welding high chromium, high nickel alloys both in solid plate form and as Pykrome. In attendance: W. C. Johnson, president; A. E. Maskrey, chief metallurgist.

International Nickel Co., Inc., New York. Booth D-87.

Exhibiting: Typical applications of nickel and nickel alloys.

In attendance: F. B. Coyle, C. A. Crawford, H. J. French, G. F. Geiger, F. P. Huston, C. McKnight, J. W. Sands, H. E. Searle, J. S. Vanick, T. H. Wickenden, A. G. Zima, E. J. Bothwell.

Iron Age, New York. Booth A-9.

Exhibiting: Copies of the Iron Age and reprints of the Iron Age National Metal Exposition inserts which will be distributed to visitors and exhibitors on request.

In attendance: F. J. Frank, president; W. W. Macon, editor; G. L. Lacher, managing editor; C. G. Wright, news editor; E. F. Cone, associate editor; S. G. Koon, associate editor; R. E. Miller, editorial staff; R. A. Fiske, Chicago editor; F. L. Prentiss, Cleveland editor; Burnham Finney, Detroit editor; T. H. Gerken, Pittsburgh editor; C. S. Baur, general advertising manager; H. E. Leonard, advertising dept.; Oliver Johnson, advertising dept.; B. H. Hayes, advertising dept.; F. S. Wayne, western representative; W. B. Robinson, Pittsburgh representative; Emerson Findley, central western representative; Chas. Lundberg, Philadelphia representative; B. L. Herman, western New York State representative; Peirce Lewis, Detroit and Cincinnati representative; D. C. Warren, New England representative; W. C. Sweetser, New Jersey representative; C. H. Ober, New York representative; A. H. Dix, subscription manager.

Ivins' Steel Tube Works, Inc., Ellwood, Oak Lane, Philadelphia. Booth D-86.

Exhibiting: Seamless low carbon steel tubes, seamless chrome-molybdenum aircraft tubing. Seamless aluminum tubing and seamless stainless steel tubing of the 18 and 8 analysis in sizes from 2 in. O.D. on down to small sizes less than 1/4 in. O.D.

In attendance: Ellwood Ivins, president; William Feenie, vice-president; Horace S. Kircher, vice-president; John B. Cording, treasurer; Stanley Jefferies, metallurgist.

Jessop Steel Co., Washington, Pa. Booth A-21.

Exhibiting: A reception booth.

In attendance: R. E. Emery, president; F. T. H. Youngman, secretary and treasurer; R. E. Malmberg, metallurgist; M. R. Trembour, metallurgist; A. W. Lucas, district sales manager; H. A. Scallen, salesman; M. W. Singer, special representative; R. M. Paxton, Jr., district sales manager.

Jones and Laughlin Steel Corp., Pittsburgh. Booths C-54 and D-81.

Exhibiting: Displays of Jalcase steel, samples of parts machined from Jalcase steel, cold finished steel bars, wide cold rolled flats, J. & L. turned and ground shafting, J. & L. high sulphur screw steel and J. & L. cold heading wire. Also J. & L. steel piling, light weight channels and junior beams.

In attendance: Wm. B. Todd, general manager of sales; J. Davis Allen, manager of sales, cold finished steel; A. A. Wagner, assistant manager of sales, hot rolled steel; R. W. Light, salesman, Detroit office; S. W. Smith, salesman, New York office; H. W. Graham, general metallurgist; C. F. Goldcamp, metallurgical engineer; S. L. Case, research supervisor; C. C. Henning, metallurgist; G. C. Congdon, advertising manager; S. A. Fuller, district sales manager, Boston; Ray S. Adams and Phil Bradbury, Boston office.

Kelley-Koett Mfg. Co., Inc., Covington, Ky. Booth A-3.**Kemp Mfg Co., C. M., Baltimore.** Booth Gas Section.

Exhibiting (in operation): The series "S" Industrial Carburetor—first showing of this new device for premixing gas and air; immersion melting as applied to soft metals; gas burning under water.

In attendance: E. B. Dunkak, sales manager; R. S. Van Note, New England representative; W. M. Ponder, sales engineer; F. H. Andrews, sales engineer; Wm. Hunt, research engineer.

Kleist and Son, Charles, Jamestown, N. Y. Booth D-90.

Exhibiting: Drop hammer boards for board drop hammers showing the following: standard type boards; leather laminated boards; special constructed boards; built-up-type constructed boards; ram pins; miniature wooden model drop hammer (operating).

In attendance: H. E. Kleist.

Leeds and Northrup Co., Philadelphia. Booths A-221 and A-223.

Exhibiting (in operation): Micromax, the improved L. & N. potentiometer pyrometer with an improved balancing mechanism that provides speedier recording, micrometer sensitivity, and freedom from adjustment, also, the instrument is self-standardizing; the new Ho-Hump multiple purpose furnace that can be used for Hump method hardening, for Homo method tempering or drawing and for Homo method nitriding; the Hump hardening furnace; miniature furnaces demonstrating the advantages of Hump and Homo methods; charts and data on hardening, tempering and nitriding; the L. & N. optical pyrometer; potentiometers for checking pyrometer equipment.

In attendance: G. W. Tall, sales manager, furnace division; H. Brewer, sales manager, pyrometer division; A. E. Tarr, assistant sales manager, furnace division; E. B. Estabrook, assistant sales manager, pyrometer division; Jordan Korp; E. H. Carlson; W. A. Lane, district manager, furnace division; O. Brewer, district manager, pyrometer division; E. I. Hope; R. A. Drescher; C. H. Parker.

Lincoln Electric Co., Cleveland. Booth D-154, 156.**Linde Air Products Co., New York.** Booth D-149, 151, 153.**Ludlum Steel Co., Dunkirk and Watervliet, N. Y.** Booth B-49.

Exhibiting: Applications of various kinds of tool steel by tools and dies, and samples of the product. Special prominence will be given such brands as L-XX high speed steel for general use, Deward and Huron Die steels, Mohawk Hot Die and Seminole chisel and punch steel. Other features will include Super Panther cobalt tool bits for heavy duty machine work, drill rod and cold drawn products, high speed steel forgings and Silrome automotive valves. Also Carmet carbide metal tools and dies.

In attendance: A. F. Dohn, vice president and sales manager; C. B. Templeton, assistant to the president; F. B. Lounsbury, vice president and works manager; J. C. Gearhardt, New England district sales manager; D. Harmon and J. F. Dolan, salesmen.

Madison-Kipp Corp., Madison, Wis. Booth A-233.

Exhibiting (in operation): An automatic die casting machine and die casting department equipment. There will also be an exhibition die with automatic Kipp core mechanism. A wide assortment of Kipp castings made on Madison-Kipp machines from east, west and central states. Kipp air tools and accessories, Madison-Kipp lubricators.

In attendance: T. E. Coleman, president; A. T. Lillegren, sales manager; J. A. Courter, eastern sales manager; T. C. Korsmo, chief engineer, die casting division; R. J. Schultz, foreman, die casting division; A. S. Kidd, general superintendent.

Magnetic Analysis Corp., Long Island City, N. Y. Booth D-92.

Exhibiting (in operation): A magnetic analysis portable type laboratory equipment which will be in operating condition to demonstrate the non-destructive inspection of iron and steel for physical and chemical properties by our method. Samples typical of problems to which the apparatus is applicable will be on hand for demonstration purposes.

In attendance: William S. Gould, Jr., secretary-treasurer; Frank O. Fischer, assistant chief engineer; A. A. Archibald, metallographer.

Machler Co., Paul, Chicago. Booth Gas Section.**Mahr Manufacturing Co., Minneapolis.** Booth C-311.

Exhibiting: Photographs and blue prints of recent interesting Mahr furnace installations, Mahr individual blowers, the new series "Forty" Mahr burners, safety automatic shut-off valves.

In attendance: W. G. Barstow, vice-president; Ray G. White, New York representative; E. F. Pica, Pennsylvania representative.

Marburg Bros., New York. Booth A-231.**McDonald & Co., P. F., Boston.** Booth D-88.

Exhibiting: Maccos Swedish steels; Certified water hardening straight carbon tool steel; Royal Crown oil hardening tool and die steel; Maccos Kromax Special alloy die steel for long-run, high production tools; Fool-Proof alloy chisel steel; cutlery sheets; die blocks and special sections; Sandvik Swedish high carbon, cold rolled French-finished annealed spring steel—also, straw-tempered and bright tempered; gauge steel from .0015 in. to .032 in. thickness; special strip steels, all carbons and all tempers, for every requirement, including band saw steel, safety razor blade steel, tape steel, watch main spring steel, clock spring steel, pendulum spring steel, shutter spring steel, rule steel and pen steel, etc.; Maccos genuine Swedish iron, bars and sheets, also, cold drawn and cold rolled for electrical requirements, in bars and wire, also strips and sheets.

In attendance: P. F. McDonald, president; M. J. McDonald, vice president, in charge of sales; N. Louis Schuver, manager of steel department; J. M. Dunlevy, district sales manager, New York and Connecticut; Frank J. Neely, sales engineer; J. R. MacCracken, district sales manager, Chicago.

Metal and Thermit Corp., New York. Booth C-133.

Exhibiting: Specimens of Thermit and electric welding; welding electrodes.

In attendance: John B. Tinnon, sales manager, Thermit department; J. H. Deppeler, chief engineer; C. D. Young, district manager.

Michiana Products Corp., Chobaltic Division, Michigan City, Ind. Booth A-5.

Exhibiting: Fire Armor, Zorite, Contraloy, no. 48 and other alloy castings for resisting heat and acid. Also fabricated parts in sheet and cast form for heat and acid resistant service.

In attendance: W. B. Sullivan, vice-president and general manager; L. H. Whiteside, Chicago representative; J. W. Mull, Jr., Indianapolis representative; A. A. Cash, Detroit representative; C. M. Conner, Philadelphia representative; J. F. Sweeney, New York representative; E. E. Whiteside, Cleveland representative; H. Klouman, metallurgical engineer.

Midvale Co., Nicetown, Philadelphia. Booths A-4 and B-33.

Exhibiting: Our trademark "M" and "Star". The outside legs of the "M" will support display boards exhibiting tools, dies and products made from Midvale tool and alloy bar steels. The middle legs of the "M" will support heat resisting and acid resisting castings. The five pointed "Star" will enclose a display of hardened and ground forged steel rolls.

In attendance: H. L. Frevert, vice-president in charge of production; Stuart Hazlewood, vice-president in charge of sales; Henry Ziesing, general sales manager; H. E. Rowe, bar steel sales manager; T. H. Nelson, engineer; A. R. Hamilton, engineer; J. W. Juppenlatz, engineer; F. B. Foley, research engineer; J. R. Adams, superintendent special products; F. J. Sleath, service department; R. M. Bird, district sales manager, New York; W. B. Smyth, district

sales manager, Cleveland; Harvey Garrett, district sales manager, Pittsburgh; F. W. Sager, district sales manager, Chicago; T. G. Besom, sales representative, New England; A. H. Stewart, sales representative, New England; Wm. Ketcham, sales representative, New York; A. C. Dinkey, Jr., sales representative, New York; A. F. Geist, sales representative, New York.

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. Booth A-220.

Exhibiting (in operation): Motor operated valves for industrial furnaces; proportioning electric motor control system; temperature controllers; pressure controllers; combustion safety controllers; diaphragm gas and air valves; safety shut-off valves; solenoid valves; unit heater controls; vent damper control motors; relays.

In attendance: R. L. Goetzberger, manager, industrial regulator department; Wm. F. Arnoldy, manager, Boston office; A. P. Mudgett, manager, New York office; J. E. Haines, industrial regulator sales engineer, New York office; L. H. Plum, industrial regulator sales engineer, Philadelphia office; Wm. Marsh, industrial regulator sales engineer, Boston office; F. H. Smith, Boston office.

Molybdenum Corp. of America, Pittsburgh. Booth D-80.

Exhibiting: Miscellaneous molybdenum iron castings; samples of various chemical and metallurgical products of molybdenum and tungsten.

In attendance: Van Rensselaer Lansingh, William H. Phillips, Harold P. Furlong.

Morse Twist Drill and Machine Co., New Bedford, Mass. Booth A-19.

Exhibiting (in operation): Machine to show cutting efficiency, i.e., torque and point pressure of drills, reamers, taps, etc., used in various materials. Sensitive drill press to test the quality of wire size drills, machine screw taps, in materials such as aluminum, Bakelite, brass, etc. Display of the Morse line of taps, dies, reamers, cutters, drills, special tools. Various booklets and charts covering speeds, feeds, etc., for distribution purposes. The new Tap Manual will be available.

In attendance: Robert Martin, sales department; Frank H. Pickles, sales department; A. J. Snyder, tool engineer.

Nathan Manufacturing Co., New York. Booth A-228.

Exhibiting (in operation): Mechanical lubricators for all industrial purposes. These lubricators will be shown in operation and as running sectional models to show their unique construction and working principles. Their construction embodies positive driven pistons, simultaneously reciprocating and oscillating, that guarantee positive oil feed without the use of valves. Also Nathan automatic oil feeders for lubricating pins and bearings.

In attendance: Mark H. Potter, sales engineer.

National Electric Light Association, New York City. Booths C-306, 308, 310.

Exhibiting (in operation): Two heat treating furnaces; one metal heater; one high frequency melting furnace. One of the heat treating furnaces will be equipped with a 6-point temperature recorder to demonstrate the uniformity of heat distribution in the furnace.

In attendance: The following members of the Industrial Heating Committee, National Electric Light Association: Glenn Coley, W. E. Benninghof, C. E. Loomis, C. E. Russell, J. H. Faulkner, D. H. Gerhard, R. T. Kaighin, J. A. Danver, J. L. Faden, chairman.

New England Gas Association, Boston. Booth, Gas Section.


Continued on Page Eight

GENUINE

TOOL STEEL

1774 1931

BACKGROUND



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That indefinable quality so rarely found... that inimitable, intangible character consciously recognized as genuine but difficult to analyze.

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FIRMS IN EXPOSITION

(Continued)

New England Metallurgical Corp., South Boston, Mass. Booth B-42.

Exhibiting: Photographs of the modern heat treating equipment used at the South Boston plant of the New England Metallurgical Corp., as well as some parts such as gears, tools, etc., which have been heat treated for their various customers.

In attendance: A. D. Bach, president; Dow M. Robinson, superintendent.

New Jersey Zinc Co., New York. Booths C-50 and D-77.

Exhibiting: A group of interesting zinc die castings manufactured by our customers. This collection will consist of raw and finished castings; single and in complete assembly. Many of the die castings illustrate the recent adoption by various industries of zinc die castings—a modern trend in design.

In attendance: A. E. Mervine, manager of metal division; William P. Hardenbergh, assistant manager metal division; D. P. Brannin, sales representative; C. R. Maxon, W. W. Broughton, S. E. Maxon, A. F. Bremble, technical service division; R. Davison, manager advertising division; R. L. Davis, advertising division.

Newton Die Casting Corp., New Haven, Conn. Booth D-74.

Exhibiting: Samples of zinc base alloy, aluminum base alloy, lead base alloy, tin base alloy, representing varied simple and intricate items used by such industries as automotive equipment and accessories, electrical household appliances, toys, hardware, machinery, electrical equipment, office appliances, vending, calculating and other machines of this nature, radio, etc.

In attendance: W. G. Newton, H. C. Wildner, C. J. Boyle, H. LaMontagne, H. Marcks, C. Ohse, F. Tobias, George Meyer, W. Edsall, A. Lintel, H. Ebberts.

Nicholson File Co., Providence, R. I. Booth B-268.

Nitrallloy Corp., New York. Booth A-18.

Exhibiting: Various nitrated parts, etc.

In attendance: Dr. Victor O. Homerberg, John P. Larkin, Robt. Bannon, J. P. Walsted.

Northwestern Manufacturing Co., Milwaukee. Booth B-122.

Exhibiting (in operation): Hansen Arc Welders with internal stabilizer, self-excitation, automatic voltage control, and a single micrometer adjustment for changes in welding current. A display of separate units and sectionalized parts will show the extreme simplicity, the ruggedness and the novel electrical features of these welders. In operation there will be demonstrated unusual arc stability and arc recovery over a wide welding range.

In attendance: K. L. Hansen, chief consulting welding engineer; E. C. Caluwaert, sales manager, Hansen Arc Welder division. From Smith Welding Equipment Eastern Corp., Eastern distributors for Northwestern Mfg. Co.: George H. Abel, L. S. Hunsberger, G. H. Guillet, L. A. Davis and Romaine C. Price.

Norton Co., Worcester, Mass. Booths C-315, 317.

Exhibiting (in operation): Alundum grinding wheels; Crystalline grinding wheels; Norton refractories; high speed grinding machines.

In attendance: R. P. Capron, salesman, wheel division; J. S. Rose, salesman, wheel division; Fred Lieby, salesman, refractory division; W. H. Henson, salesman, refractory division; R. J. Gillander, refractory division; F. H. Stenberg, publicity department.

Ohio Steel Foundry Co., Springfield, Ohio. Booth A-12.

Exhibiting: Carburizing containers, both sheet and cast; furnace castings; heat saver valve; centrifugal castings; pyrometer tubes; cyaniding fixtures; lead and salt pots; miscellaneous heat resistant castings.

In attendance: W. J. Gilmore, vice president; C. E. Malley, sales manager, alloy division; F. K. Ziegler, manager, alloy division; E. L. Malone, New York representative; F. D. Rice, Philadelphia representative.

Olsen Testing Machine Co., Tinian, Philadelphia. Booth C-72.

Exhibiting (in operation): A new type Universal testing machine with a new straining and weighing system. This has never before been exhibited. Also for the first time will be shown various types of Firth Hardometers for determining the hardness of sheet stock or nitrided parts. Also Olsen Brinell hardness tester with new type drive; Herbert Pendulum Hardness Tester and equipment; new development in Olsen ductility test equipment; verifying rings with electrically operated vibrating rings; strain gauges and extensometers; Warner reverse bend testing machine; M. I. T. folding endurance paper tester. Also the largest static-dynamic balancing machine ever shown in a U. S. exhibition. This Olsen-Lundgren style "S" machine is for balancing heavy crankshafts, etc.

In attendance: Thorsten Y. Olsen, R. B. Lewis, H. H. Gildner, Jacob Lundgren, Bruce L. Lewis.

Page Steel and Wire Co., New York. Booth C-141.

Exhibiting: All of the varied grades of welding wire and electrodes manufactured by the Page Steel & Wire Co. and an electric display board showing the individual wires.

In attendance: W. H. Bleecker, sales manager; E. L. Schaffer, district sales manager; J. J. Flaherty, manager, welding wire division; F. O. Walls, salesman.

Parker-Kalon Corp., New York. A-224.

Exhibiting: A No. 16 Special Hydro automatic furnace equipped to case harden both basket and racked work.

In attendance: Charles J. Martin, assistant sales manager; A. W. Meader, Robert Mitchell.

Pels and Co., Inc., Henry, New York. Booths C-322, 324.

Exhibiting (in operation): Type FV-30 Pels bar and billet shear with guaranteed unbreakable steel plate frame; with new style patented knives for obtaining square and clean cuts on rounds and squares so that these can be used for upsetting without previous grinding. Type MAE-13 Pels combination punch, plate shear, angle, bar and tee cutter with built-in notcher—with guaranteed unbreakable steel plate frame. Type MK-10 newly brought out Pels combination punch, plate shear, angle, bar and tee cutter with built-in coper for light iron work—with guaranteed unbreakable steel plate frame.

In attendance: Curt L. Martin, president; Thomas F. Kane, sales manager; Joseph A. Weigand, service engineer; David T. Gately, New England representative.

Permutit Co., New York. Booth A-218.

Pressed Steel Co., Wilkes-Barre, Pa. Booth C-64.

Exhibiting: A complete line of the original Rezistal Lite-Wate carburizing and annealing containers—all sheet construction with seamless formed bottoms—welded by our special process. Alloy castings, such as furnace parts, trays, covers and pots. Seamless formed alloy stampings—perforated sections.

In attendance: J. H. MacVeigh, sales manager; F. L. McGarry, assistant sales manager.

Process Engineering and Equipment Corp., Attleboro, Mass. Booth C-309.

Exhibiting (in operation): One special atmosphere, electric conveyor furnace for bright annealing; one ammonia dissociator for producing the furnace atmosphere; one nitrogen producer for burning dissociated ammonia. Also complete Preco bright annealing equipment.

In attendance: P. H. Littlefield, assistant manager; J. F. Schrumm, technologist; J. MacVicar and P. Reihl, engineers.

Production Machine Co., Greenfield, Mass. Booth B-34.

Exhibiting (in operation): Type "A" centerless feed polishing and finishing machine for automatically finishing tubes and cylindrical pieces (heavy duty). Type "S" centerless feed polishing and finishing machine for polishing and buffing cylindrical pieces also furnished for grinding, surfacing and burring. Type "D" (patent cushion wheel) belt polishing machine particularly suited for hand polishing.

In attendance: W. S. Howe, president; A. H. Behnke, vice-president, sales manager; T. A. Welch, superintendent; R. W. Fuller, designing engineer.

Pyrometer Instrument Co., New York. Booth A-237A.

Ransohoff, Inc., N. Cincinnati. Booth A-237.

Exhibiting (in operation): One acid star return pickling machine, which will be in operation cleaning forgings. This new machine is rubber lined and is a complete unit which will take the forgings as they come from the trimming presses and descale them with the combination of the acid and star return action. The same machine will neutralize, wash and dry them.

In attendance: N. Ransohoff, C. A. Albrecht.

Reeves Pulley Co., Columbus, Ind. Booth B-270.

Exhibiting (in operation): The new Reeves enclosed design variable speed transmission, with centralized lubrication features. The new vertical Reeves transmission with universally adjustable Reeves pivoting motor base and tachometer speedometer. The new Reeves electric automatic and electric remote controls, with latest development in carbon pile switches. The Reeves transmission with motor base showing the compact Reeves variable speed power unit drive. The Reeves counter-shaft unit for large speed reduction combined with accurate and sensitive speed regulation and control. Various combinations of Reeves equipment to meet all speed control problems. Cut-away parts showing the latest designs and developments in Reeves radial and thrust bearing mounting, together with force feed lubrication. The Reeves double-block, center-pull V-belt with cord body and with cast aluminum split splice block with interlocking steel plates and quick-make two steel pin assembly. The Reeves dial speed indicator, which is standard on all Reeves variable speed transmissions.

In attendance: D. W. Clem, vice-president; E. R. Baum, E. S. Redmerski, H. B. Diehl and H. W. Randolph, sales engineers.

Republic Steel Corp., Youngstown, O. Booths A-6-8; B-35-37.

Exhibiting: Agathon alloy steels; Enduro stainless steels; Toncan iron; Republic electric welded pipe; Upson bolts and nuts; Agathon nitralloy.

In attendance: J. M. Schlendorf, manager of sales, alloy steel division; M. H. Schmid, assistant manager of sales, alloy steel division; G. F. Hess, assistant manager of sales, alloy steel division; M. J. R. Morris, chief metallurgical engineer; E. R. Johnson, metallurgical department; V. W. Whitmer, metallurgical department; A. J. Wilson, metallurgical department.

Riehle Bros. Testing Machine Co., Philadelphia. Booth B-36.

Exhibiting (in operation): Precision hydraulic universal testing machine; production Brinell testing machine; Vickers pyramid hardness tester.

In attendance: A. F. Riehle, vice-president and general manager; R. G. Clark, sales manager; Wm. C. Moran and Alfred Sonntag, research engineers.

Rockwell Co., Stanley P., Hartford, Conn. Booths C-312, 314.

Exhibiting (in operation): Model LB Rockwell dilatometer for critical temperature determination and coefficients of expansion combined with laboratory furnace for heating. This equipment allows the steel to be quenched in the instrument, thereby securing the dilation and temperature changes of the steel during the

quench. This equipment can determine the proper rates of heating to secure the minimum amount of shape change in the final work. This equipment is adapted for studying quenching mediums. Rockwell quenching tank agitators for oil, water or brine to keep quenching tanks in agitation and prevent overheating. It will be shown how its use increased the hardness of work quenched in a stream, how it can be used for circulating systems, and for emptying quenching tanks for cleaning purposes. Heat-treating tongs for handling tools, dies, etc., made in various standard sizes, well balanced.

In attendance: Stanley P. Rockwell, president and technical adviser; Kenneth Stumpf, vice-president, in charge of heat-treating department; William A. Stumpf, secretary and sales manager; Harold W. Birk, manufacturing department.

Roebing's Sons Co., John A., Trenton, N. J. Booth A-103.

Exhibiting: Flat wire and welding wire sample boards in background along with water-color or painting descriptive of the welding process.

In attendance: A. E. Gaynor, salesman; H. P. Peabody, salesman; F. J. Maple, advertising manager.

Roessler and Hasselbacher Chemical Co., Inc., New York. Booth C-66.

Exhibiting (in operation): a complete display of sodium cyanide, cyanide mixtures, and salts used in the case hardening, heat treating, and heat coloring of steel. A complete display of metal cyanides and accessory chemicals used in the electroplating of steel particularly for rust proofing. Articles illustrating the application of these chemicals. A small scale unit for electroplating, demonstrating the application of copper, Duo Zinc, Cad-alloy, and Brite Alloy for metal finishing.

In attendance: W. M. Gager, metallurgist; Dr. D. A. Holt, chemist; C. H. Proctor, plating expert; W. J. Schneider, plating expert; G. W. Goerner, manager Boston sales office; E. J. Sears, J. F. Finnick, J. F. Spillane, sales representatives Boston office.

Ryan, Scully & Co., Philadelphia. Booth C-325.

Ryerson & Son, Inc., Joseph T., Cambridge, Mass. Booth A-27.

Safety Gas Lighter Co., Lynn, Mass. Booth C-152.

Scherr Co., George, New York. Booth C-70.

Exhibiting (in operation): Complete line of Carl Zeiss precision measuring tools, including the following new items: universal gear tester; cam shaft checking device; Ultra Optimeter measuring in 1/100,000 in.; Portable lead tester; portable thread profile microscope; Optotest mirror gage. The Ultra Optimeter is a brand new development as an optical comparator of super-accuracy, making it possible to read directly in 1/100,000th in. with the possibility of estimating a few millionths in. the guaranteed inherent accuracy of the instrument.

In attendance: George Scherr, president; F. Koenig, secretary; R. P. Friis, representative.

Selas, Co., Philadelphia. Booth Gas Section.

Exhibiting (in operation): Gas and air mixers for industrial heating together with industrial gas burners, torches, soldering irons, and examples of recent developments in special burners for various industrial processes. The equipment exhibited is suitable for use with manufactured gas, natural gas or butane gas.

In attendance: Richard C. Jordan, eastern sales manager; Henry W. Le Boutillier, president; Fred Hess, vice-president.

Sentry Co., Taunton, Mass. Booth B-267.

Exhibiting (in operation): Improved Sentry Diamond Blocks for hardening high speed steel without scale, decarburization or reduction in size. Shown for the first time is a new furnace, designed for temperatures up to 2500° F., for hardening high speed steel in connection with the diamond blocks. Also a new high temperature (2550° F.) tube furnace especially for combustion analysis of steels. Also a Sentry model "L" pot furnace with many patented features.

In attendance: Percival B. Crocker, treasurer, and Willys MacComb, sales manager.

Shakeproof Lock Washer Co., Chicago. Booth B-277.

Exhibiting: Shakeproof lock washers, terminals and locking set screws.

In attendance: Harold C. Smith, president; F. W. England, vice-president; C. G. Olson, vice-president; C. L. Johnson, secretary and treasurer; J. M. Gribbie, sales manager; R. H. Welton, W. V. Klimmer.

Smith and Sons, Inc., David H., Brooklyn. Booth A-235.

Exhibiting (in operation): Model 91, size 16 Smith Quadruple combination punching and shearing machine. Punches and shears, beams, plates, angles, channels, and cuts rounds and squares. Model BO, size 20 Smith angle bending rolling machine, for rolling angles, tees, channels, beams, etc., cold. 200 amp Smith-Waters electric arc welding machine.

In attendance: Dudley J. Smith, vice-president; George H. Kennedy, Jr.; Joseph A. Rourke.

Smith Welding Equipment Eastern Corp., Philadelphia. Booth B-120.

Exhibiting (in operation): A complete line of Smith's oxy-acetylene welding and cutting torches, ball-bearing regulators, oil preheating torches, lead burning and brazing outfits, accessories and supplies. Featured will be Smith's Lifetime Guarantee welding and cutting torches. All the wearing parts such as seats and valve stems as well as other parts subjected to severe abuse as tubes, heads and handles are made of wear-resisting Monel metal. Another feature will be a display of the steps in the manufacture of Smith's cutting tips. We will demonstrate the latest type of Smith's No. 2 welding and cutting torches which have been especially designed for work on aircraft fittings and fuselages, automobile bodies, and light sheet metal parts. Accessories and supplies for oxy-acetylene and electric welding, including: Smith's A-Mal-Gam fluxes in grades No. 1, 2, and 3 for welding cast iron and bronze and for general brazing; goggles, spectacles, welding rods, electrodes, face shields, helmets, lenses, etc.

In attendance: George H. Abel, general manager; L. S. Hunsberger, assistant sales manager; G. H. Guillet, district manager, New England; L. A. Davis, district manager, Eastern Pennsylvania; Romaine C. Price, district manager, New York City.

Spencer Turbine Co., Hartford, Conn. Booth A-230.

Exhibiting (in operation): Spencer Turbo-compressors which are used for supplying air in connection with oil and gas burning industrial furnaces, foundry cupolas, etc. One 10 H. P. machine will be operating to deliver air for furnaces in operation during the show. One 5 H. P. machine will be on exhibit with casing and end heads made up of stainless steel (KA-2) and impellers made up of duralumin for handling injurious gases and acid fumes.

Continued on Page Nine

LEEDS & NORTHRUP COMPANY PRESENTS

MICROMAX

THE IMPROVED L & N POTENTIOMETER PYROMETER

MICROMETER SENSITIVITY,
SELF-STANDARDIZATION
AND HIGH-SPEED RECORDING

NOW comes the fully automatic potentiometer—Micromax—the improved L & N Potentiometer Pyrometer, embodying basic improvements, raising the potentiometer pyrometer to a new high level of accuracy, of reliability and of strictly automatic operation.

Like the announcement made over twenty years ago, when Leeds & Northrup introduced the first industrial potentiometer pyrometer, today's announcement brings pyrometer users basic new advantages—a new order of sensitivity, speed, accuracy and reliability.

No Daily Attention—No Adjustments

The new Micromax "scissor-action" balancing device is so microscopically sensitive that it will detect deflections of the galvanometer pointer amounting to 1/1000th of an inch. It is practically unaffected by wear. It requires no adjustments. Its recording action is responsive and speedy as no potentiometer recorder has ever been—so fast that the pen or print-wheel on a Micromax Recorder will step across the entire 9 3/4 inches of calibrated chart in less than twenty-two seconds. Its non-slip clutch is automatically prevented from attempting to move the mechanism beyond either end of the scale.

Micromax is the fully automatic industrial potentiometer pyrometer. It needs no daily attention; the instrument circuit in every model is standardized automatically, every forty-five minutes or less, more accurately than can be done manually.

To industry in general, and in particular to the many thousands of present users of L & N Potentiometer Pyrometers, Micromax is presented as the culmination of over twenty years of specialization in industrial potentiometer pyrometers and of three years of concentrated work in the final development of its particular refinements.

See MICROMAX and also the New General-Purpose HO-HUMP Furnace at the Metal Show in Boston, September 21-25

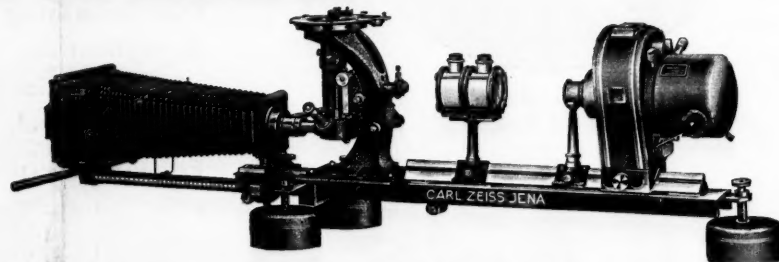
LEEDS & NORTHRUP COMPANY
4901 STENTON AVENUE PHILADELPHIA, PA.
LEEDS & NORTHRUP
Branch Offices: Pittsburgh Cleveland Detroit Chicago St. Louis Houston Tulsa Los Angeles San Francisco

A NEW STANDARD OF ACCURACY AND DEPENDABILITY IN INDUSTRIAL PYROMETERS

P-247

CARL ZEISS

6 1/2 x 8 1/2
Metallograph
with inverted
microscope



The focusing mechanism is independent of the rigidly supported stage, and ample steadiness is assured at all magnifications.

Homal lenses provide for a maximum flatness of field without sacrifice of definition.

Metallograph with arc lamp, 4 apochromatic objectives, 6 compensating oculars, 3 homal lenses.....price \$1,293.50 f.o.b. N. Y.

A copy of descriptive catalog Micro 397 will be supplied on request.

The 6 1/2 x 8 1/2 metallograph and other Zeiss instruments of interest to metallographers will be on exhibition at Booth A7, The National Metal Exposition, September 21-25, Boston, Massachusetts.



CARL ZEISS INC., 485 FIFTH AVENUE, NEW YORK
Pacific Coast Branch: 728 South Hill Street, Los Angeles, Calif.

The Super-Sensitive
"Scissor-Action" Balancing Device

Requiring no adjustment and not affected by wear, the Micromax "scissor-action" balancing unit responds to galvanometer pointer deflections as small as 1/1000th of an inch.

Variables due to daily manual standardizing of the instrument circuit are also eliminated in Micromax. Every forty-five minutes or less the circuit is standardized automatically—more accurately than is done manually. The mechanism itself potentiometer operation.

To Present Users of
L & N Potentiometer Pyrometers

In accord with our established policy, protection is given to the thousands of present users of L & N Potentiometer Pyrometers in that the Micromax "scissor-action" balancing device and the automatic standardizer are unit assemblies which can be installed in present L & N recorders in the user's own plant, with little or no interruption to service.



OF NEW
CATALOG
E-87

FIRMS IN EXPOSITION

(Continued)

In attendance: H. H. Richardson, president; F. A. Wright, special representative; R. A. Brackett, sales department; W. V. Paine, chief engineer; L. C. Smith, engineering department; L. K. Lambert, sales representative; C. M. Sawyer, sales representative.

Steel Publications, Inc., Pittsburgh. Booth D-84.

Exhibiting: The publications, Blast Furnace and Steel Plant; Heat Treating and Forging; Welding.

In attendance: D. N. Watkins, M. M. Zeder, R. E. Powell, L. R. Gurley, F. B. Yeager.

Superior Steel Corp., Pittsburgh. Booth A-15.

Exhibiting: Articles and parts made from our rust resisting material and Superior Metal such as automobile parts—lamps, radiator shells, tire covers, hood hinges, moldings and many others, also various other articles where a rust resisting metal is required. Our rust resisting material is a chrome-iron alloy containing high percentages of chromium with or without the addition of nickel. Superior metal is a material of 80 to 90% low or high carbon content steel with 10 to 20% rust-resisting material on one or both sides.

In attendance: Frank R. Frost, president; P. C. Jennings, treasurer; J. E. Wetzel, general manager of sales; Wm. P. Ewing, assistant general manager of sales; K. W. Massey, F. P. Norris, W. M. Cowles, representatives.

Surface Combustion Corp., Toledo, O. Booth, Gas Section.

Exhibiting (in operation): No. 836 large oven furnace for high pressure artificial gas, equipped with two-stage burners; one standard muffle high speed furnace for low pressure artificial gas, equipped with straight low pressure tunnel burners (this will be a live display); one No. 742 small oven furnace for low pressure artificial gas (this will also be a live display); one diffusion flame slot for low pressure artificial gas; one No. 935 pot hardening furnace for low pressure artificial gas; one Mantle recuperator type F-2; one special burner display furnace (this will be a live display); one atmospheric burner table; one 25,000 B.t.u. atmospheric air heater for artificial gas.

In attendance: F. H. Adams, C. B. Phillips, H. M. Heyn, A. L. Hollinger, E. A. Weaver, G. D. Mantle, W. F. Herdrich, J. R. Waltman, J. E. Maser, W. O. Owen, E. A. Buschow, O. S. Olsen, Fred Loftus, A. H. Koch, F. J. Evans, W. R. Culbertson, S. R. Anderson, F. C. Starr, H. J. Gregg, Edw. Stephenson, C. B. Kentnor, Hy. Schramm, D. H. Bacon.

Testing Machines, Inc., New York. Booth A-11.

Exhibiting (in operation): Schopper metals testing machines as follows: tensile strength testers for sheet metal, wires, rods, bars, etc. These testers are also equipped for compression, transverse, shearing tests, etc.; torsional strength testers for wire, etc.; impact testers, stiffness or bending testers, Brinell testers, standard as well as special types; impact hardness tester, micrometers, tachometers, laboratory scales.

In attendance: H. Z. Schniewind, president; J. H. Eaton, general manager.

Timken Steel and Tube Co., Canton, Ohio. Booth B-53.

Exhibiting: Products manufactured in our plant such as tubing, bars, rods, etc., as well as a variety of products made from Timken steel such as bearings, crankshafts, gears, etc.

In attendance: Walter H. Wiewel, manager of sales; J. H. Abbott, sales engineer; R. L. Wilson, assistant metallurgical sales engineer; S. D. Williams, metallurgical sales engineer; Robert Atkinson, district sales manager; A. E. Hunt, representative A. E. Hunt Steel Co.

Una Welding and Bonding Co., Cleveland. Booth C-135.

Exhibiting (in operation): Una arc welders, dynamotor construction, both AC-DC and DC-DC types; single and double operator; gasoline engine driven sets; full and semi-automatic welding units; the complete line of Una welding rods will be exhibited for manual and automatic welding; these include rods for high speed welding, automatic welding, hard wearing surfaces, manganese steel welding, high tensile strength and ductility, welds to withstand heavy repetitive impact stresses, vertical and overhead welding, stainless steel, copper to copper or copper to steel welding; many welded samples will be shown.

In attendance: N. R. Van Kleeck, L. R. Berkeley, A. A. Probeck, J. Vogler, C. Schaub, L. S. Burgett.

Union Drawn Steel Co., Beaver Falls, Pa. Booth D-96.

Exhibiting: Display of cold drawn steel in common bars and special sections; display of turned and ground shafting; display of automotive and aircraft crankshafts; exhibit of parts made from cold drawn bars.

In attendance: J. D. Armour, chief metallurgist; J. Allison, Hartford plant metallurgist; L. E. Creighton, vice-president and general manager; F. C. Young, general manager of sales; J. P. Barnum, district sales manager; L. Geerts, sales representative.

Vanadium Corp. of America, New York. Booth A-24.

Exhibiting: Ferro-alloys of vanadium, chromium, silicon, titanium, etc.; specimens illustrative of applications of vanadium steels; tools, dies, gears, springs, forgings, etc.

In attendance: G. L. Norris, chief metallurgical engineer; Jerome Strauss, chief research engineer; A. W. Demmler, metallurgist; H. T. Chandler, assistant to the president; C. N. Dawe, manager automotive division.

Welding Engineer, Chicago. Booth A-105.

Exhibiting: Magazines and books.

In attendance: H. S. Card, editor; T. E. DePew, eastern manager.

Wetherell Bros. Co., Cambridge, Mass. Booth B-271.

Exhibiting: Stainless steel; tool steel; cold rolled strip steel.

In attendance: F. A. Wetherell, president; L. H. Wetherell, vice-president and treasurer; L. W. Slocomb, R. A. Johnston, L. R. Quigley, E. H. Barker, A. J. Maheu, I. L. Bambrick, B. R. Heathcote, W. R. Harrington.

Wheelock, Lovejoy and Co., Inc., Cambridge, Mass. Booths B-30 and C-59.

Exhibiting: Representative sample parts machined from Hy-ten steel, showing physical properties, heat treatment and application of these alloy and special analyses.

In attendance: A. O. Fulton, president; F. H. Lovejoy, vice-president; G. S. Longley, Hartford; A. L. Knight, A. F. Erickson, H. B. Briggs, C. H. Williams, Boston.

Whitman and Barnes, Inc., Detroit. Booth B-273.

Exhibiting (in operation): One small punch press demonstrating Hercules interchangeable punches and retainers. Will have a die equipped and will run press daily. One small drill press to demonstrate Hercules

Major drills and Blue Diamond drills. Major drills for drilling 13 to 15% manganese steel; Blue Diamond high production small drills.

In attendance: E. D. Wolf, H. H. Eager, H. F. Howard, F. J. Smith, C. O. DeVeau, F. T. Harrington.

Wickwire Spencer Steel Co., New York. Booth C-298.

Exhibiting (in operation): Model of furnace showing heat resisting conveyor belt with miscellaneous goods handled on such belts; spirally woven, plate, and link heat resisting belts; model of spring wire tempering furnace; spring testing. Also Wisco welding wire, Wisco oil tempered wire, springs and forms.

In attendance: J. R. Worsfold, sales manager mechanical specialties department; O. C. Ploss, salesman; G. W. Nelson, factory superintendent; M. G. Werme, superintendent of mechanical specialties; V. C. King, conveyor engineer; J. N. Champlin, New England sales manager; E. V. Hill, salesman; W. W. Critchley, salesman; E. F. Early, factory superintendent; R. R. Tatnall, spring engineer.

Wilson-Macaulen Co., Inc., New York. Booth A-227.

Exhibiting (in operation): Rockwell direct reading hardness testers. Latest models with improvements. Indi-

cating pyrometers, recording pyrometers, potentiometer recorders, automatic control pyrometers, potentiometer controllers, electric resistance pyrometers, indicating resistance thermometer, recording resistance thermometer, automatic control pyrometers, automatic signaling pyrometers, pyrometer accessories.

In attendance: S. T. Herr, representative, Providence; S. P. Rockwell, representative, Hartford; V. E. Lysaght, Testing engineer; and others.

Zeiss, Inc., Carl, New York. Booth A-7.

Exhibiting (in operation): Photo-micrographic outfit, metallographs, microscopes, spectroscopes, magnifiers. All of these instruments are of primary interest to metallographists.

In attendance: V. M. E. Koch, vice-president; Walter Kramer and H. de Gallaix, members of sales staff.

Zurbach Steel Co., L. E., Cambridge, Mass. Booth A-17.

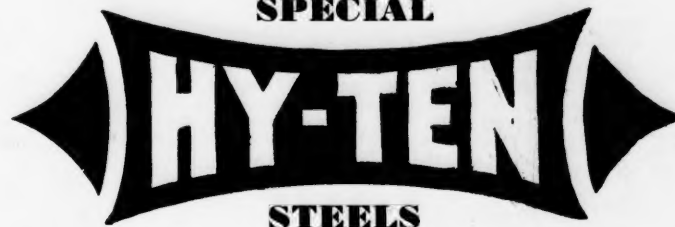
Exhibiting: Steel sheets and strips, Zurbach steel sheets, copper and zinc plated cold rolled strip steel, rustless strip and sheet steel. Articles of interest made wholly or in part from Zurbach steel sheets.

In attendance: L. E. Zurbach, president; George W. Newman, Jr., and H. Everett Ferris, sales department.

Continued on Page Ten

SPACE
B-30SPACE
C-59

SPECIAL



At spaces B-30 and C-59 we invite you to see our exhibit of unusual parts manufactured from the various grades of Hy-ten Steel.

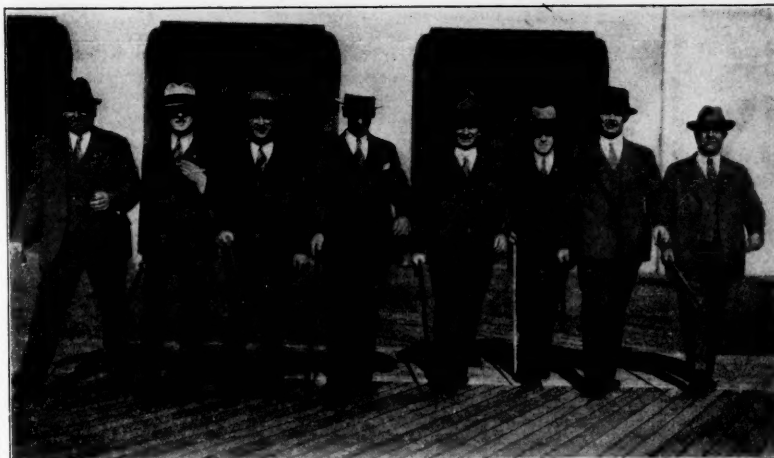
WHEELOCK, LOVEJOY & CO., INC.

128 SIDNEY STREET, CAMBRIDGE A, MASSACHUSETTS

CAMBRIDGE - NEW YORK - CLEVELAND - CHICAGO

American Gas Furnace Engineers who will be at the convention to greet you

FLEXIBILITY PARAMOUNT IN HEATING MACHINES



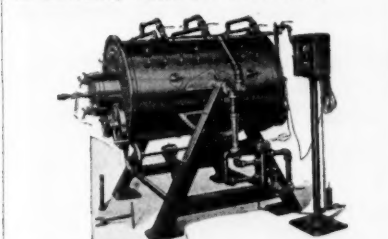
Left to right: John T. Travis, George Machlet, Jr., Elmer C. Cook, P. F. Nelson, P. C. Osterman, Theodore Farwick, Sr., Gustav Schwab, John Mehrman.

CARBURIZING DEVELOPMENT AWARDED FRANKLIN MEDAL

The importance of the invention of Adolph W. Machlet for carburizing in closed retorts, using gas or compound as the carburizing medium, has been recognized by the Franklin Institute which awarded to him the Edward Longstreth Medal Of Merit because of the advance which it has made possible in the field of heat treating.

Another achievement by the American Gas Furnace Company is the Automatic Temperature Control which also has been recognized by the Franklin Institute. This equipment, used in conjunction with heating appliances, eliminates guess work so far as temperatures and atmosphere are concerned.

For more details do not fail to see the American Gas engineers at the convention or, if you wish to post yourself in advance, write for literature.



American 600 to 750 Pound Rotary Retort Carburizer with Automatic Temperature Control.

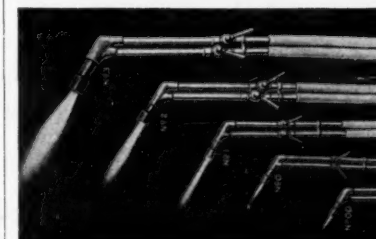
AMERICAN BLOWPIPES AND BURNERS MEET REQUIREMENTS

Natural and cylinder gas hard to burn efficiently

At many places natural gas is now being served where formerly only artificial gas was available due to the new fields which have been brought in and the extension of pipe lines.

The burning characteristics of this gas and the various cylinder gases now widely available as a result of improved methods of manufacturing gasoline are quite different from manufactured gas. Consequently many of the cruder designs of blowpipes and burners are unsatisfactory.

American Blowpipes of standard design, however, are found to give good results and American Burners, intended for use with these gases, also are proving



American Hand Blowpipes for natural, cylinder or manufactured gas.

While Heating Machines are frequently classed with machine tools it often happens that they are expected to handle a far wider variety of parts and therefore must have a greater range of applicability than the modern machine tool.

In many instances these demands are successfully met by American Heating Machines where flexibility has always been a paramount consideration.

In rotary retort Heating Machines not only carburizing but also hardening and annealing and, when properly arranged, tempering and nitrogenizing, as well as bright annealing may be done.

Continuous Heating Machines of the rotary retort type, either with or without spiral, where charging is into a hopper at one end and discharging through an outlet sealed in the quench at the opposite end, permit handling work up to the dimensions of the spiral which is always made as large as possible, again giving a wide range in the size of work to be handled in them.

Reciprocating Hearth Heating Machines are used on parts ranging from phonograph needles up to and including large die set pins. Springs of many shapes and sizes, stampings, pressed parts, etc., are all being successfully handled in these machines.

It has always been axiomatic with the American Gas Furnace Company to recommend two or more Heating Machines to handle a particular requirement rather than one large machine because of the increased efficiency obtained on a reduced production schedule and because in the case of accident production is not entirely curtailed.

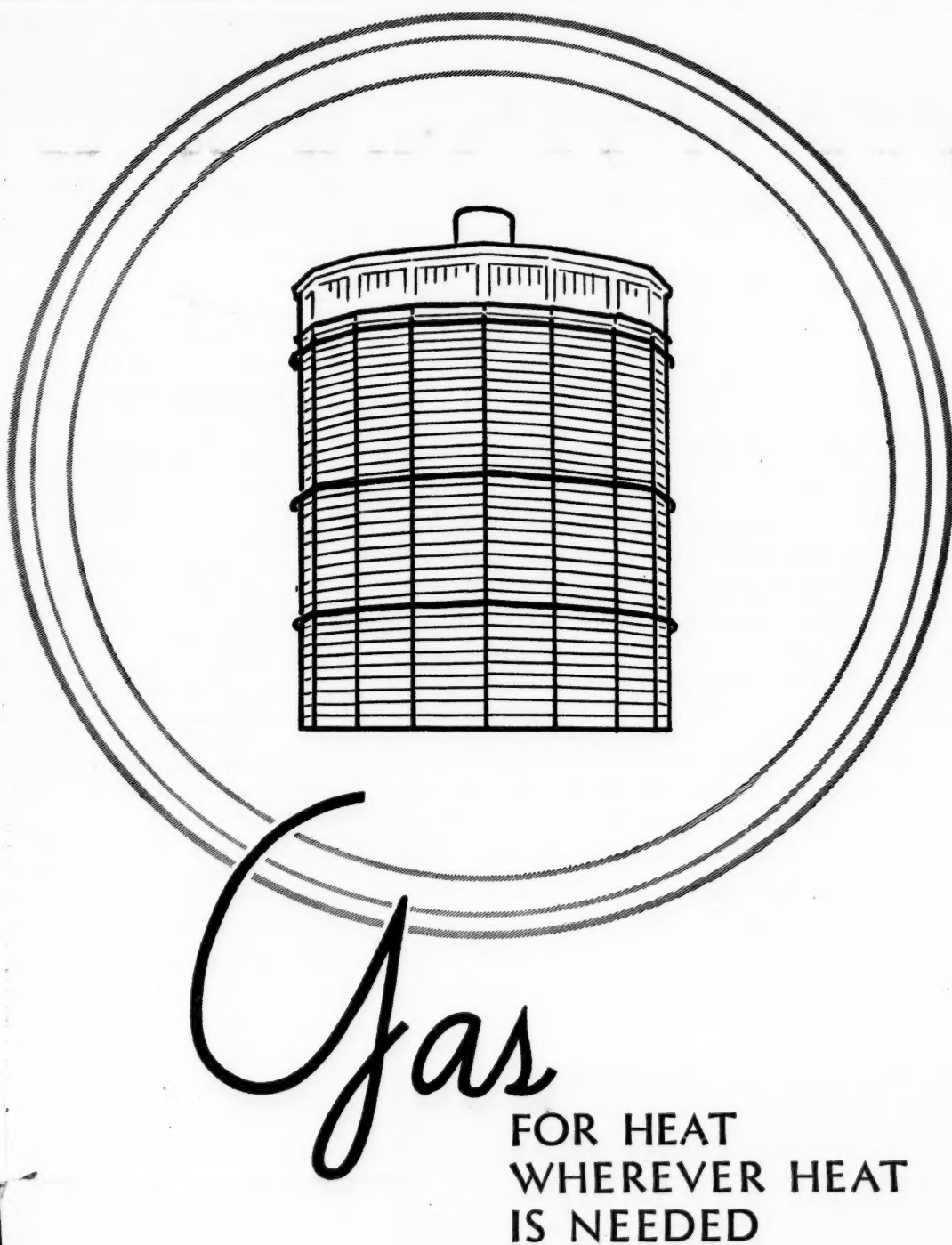
Labor saving is a major consideration and is met by hoppers on the continuous machines and by tilting features on the rotary batch type machines to facilitate rapid charging and discharging.

The American exhibit at the Exposition will include representative examples of these various types of Heating Machines. Should you desire advance information, write for booklet.

ing unusually satisfactory. These Burners are applied for Heating Machines for local hardening, tempering and annealing of saws, chisels, punches and many small formed and stamped parts. They are also used for brazing, for laboratory applications and in the manufacture of Neon light signs, radio tubes, etc.

An extensive display of American Burners will be found at the National Metal Exposition in Boston. If, however, advance information be desired, write for a copy of bulletin No. 6. It may help you solve a vexing problem.

An extensive exhibit of American heating equipment will be shown in the "Gas Section" at the Exposition. Won't you please inspect it?



FOR HEAT
WHEREVER HEAT
IS NEEDED

From the jeweler's tiny torch to the mighty blast furnace. The free book "Gas Heat in Industry" tells the whole story. Send for it.

AMERICAN Gas ASSOCIATION

420 Lexington Avenue, New York

American Gas Furnace Co., Elizabeth, N.J.

Advertisement

EXHIBITING FIRMS (Too Late to Classify)

Hayes, Inc., C. I., Providence, R. I. Booth C-319.

Exhibiting (in operation): Hayes electric furnace for heat treatment of high speed steel tools. Equipped with Certain-Curtain method for control of furnace atmosphere, to prevent scaling, decarburizing or burning of fine, expensive tools. Important users advise remarkable results in controlling dimensional change through positive control of furnace atmosphere made possible by this method.

In attendance: Carl I. Hayes, president and general manager; James E. Hines, vice president and sales manager; Carl G. Paulson, sales engineer; W. C. Gilbert, chief engineer.

Ensign-Reynolds, Inc., New York. Gas Section.

Exhibiting (in operation): Rotary type air cooled gas compressors, high pressure gas inspirators, ribbon burners, screen burners, furnace burners, flame distributing burners, air cleaning inspirators, solder stoves, small crucible furnaces, Staylite burners, immersion type tank heaters.

In attendance: F. J. Fieser, assistant to vice-president. A. Braun.

OFFERS GAS BURNER MANUAL

Webster Engineering Co., Tulsa, Okla., has just completed the publication of the Webster Manual and Data Book, after two years of compilation. It is a collection of information on industrial gas-fired burner design and application, and contains 120 pages. Copies may be obtained by writing the company.

BROWN INSTRUMENT PROMOTES BEAN

R. D. Bean, formerly manager of the engineering development department of Brown Instrument Co., Philadelphia, has been made chief engineer of that organization.

STOUGHTON HEADS ELECTROCHEMISTS

Bradley Stoughton, head of the department of metallurgy, Lehigh University, Bethlehem, Pa., has been elected president of the Electrochemical Society for the 1931-1932 year.

HERTY TO GIVE 6TH CAMPBELL LECTURE

Will Announce Subject Later

The sixth annual William deMille Campbell Memorial Lecture of the A. S. S. T. will be presented in Boston the morning of Sept. 23 in the ballroom of the Hotel Statler.



Dr. C. H. Herty, Jr.

Dr. C. H. Herty, Jr., who will deliver the lecture, is supervising chemist in charge of the metallurgical section, U. S. Bureau of Mines Experiment Station in Pittsburgh. The title of his lecture paper has not yet been definitely announced.

Dr. Herty was graduated from the University of North Carolina in 1918. Three years later he received a Master's degree in chemical engineering from Massachusetts Institute of Technology. In 1924 he was granted the degree of Sc. D. by the same institution, his thesis being on the subject "Interaction Between Gas, Slag and Metal in the Basic Open Hearth Process."

The first Campbell Lecture was delivered in 1926 by Wilhelm M. Guertler, associated with the Metall-Institut der Technischen Hochschule in Berlin. Succeeding lectures and their topics have been:

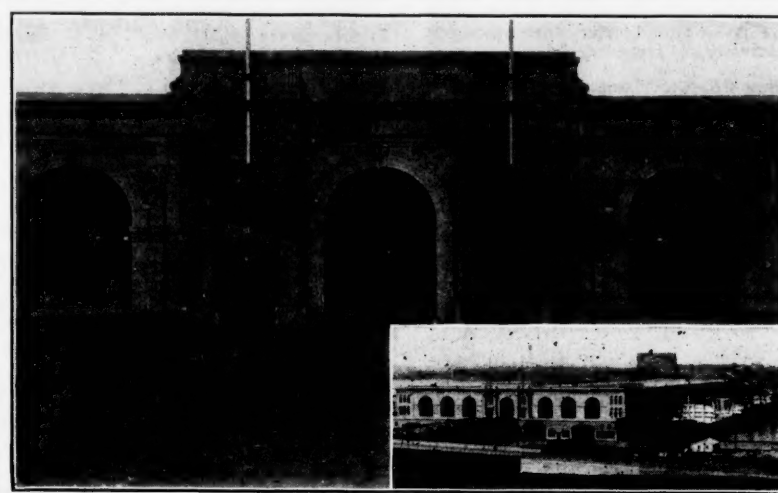
1927—Contribution to the Theory of Hardening and the Constitution of Steel by Dr. Zay Jeffries, consultant, Aluminum Co. of America and General Electric Co.

1928—Application of Science to the Steel Industry by Dr. W. H. Hatfield, Brown-Firth Research Labs., Sheffield, England.

1929—Steel at Elevated Temperatures by Dr. Albert Sauveur, Gordon McKay Professor of Metallurgy and Metallography, Harvard University, Cambridge.

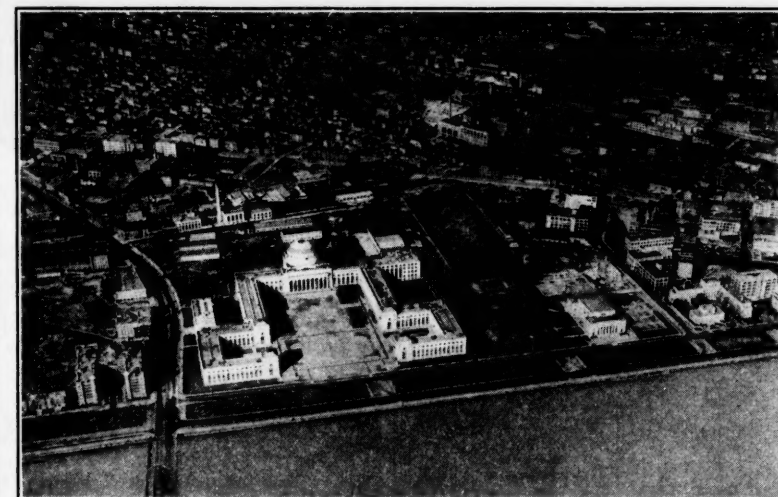
1930—Oxygen in Steel by Dr. M. A. Grossmann, Director and Vice-President, Republic Research Corp., Canton.

Where Boston Show Will Be Held



Huge Commonwealth Pier at Boston where the National Metal Exposition will be held the week of Sept. 21, 1931. A close-up of the entrance and a distant view of the building are shown in the illustration.

AERIAL VIEW OF M. I. T.



The campus of Massachusetts Institute of Technology as seen from a soaring airplane.

A. G. A. GROUP MEETS SEPT. 17-18

Five hundred manufacturers of gas appliances and equipment are expected to attend the annual session of the manufacturers section of the American Gas Association, which will convene in Detroit, Sept. 17-18, at the Book-Cadillac Hotel. Separate meetings of the gas range, water heater and space heater groups will be held in addition to the general meeting.

R. F. MEHL JOINS ARMC0 SEPT. 1

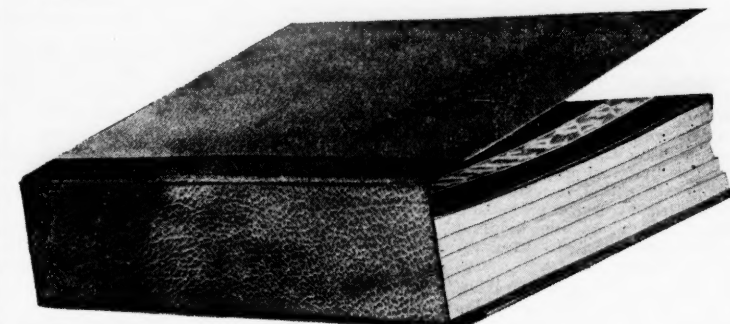
R. F. Mehl, superintendent of the division of physical metallurgy of the naval research laboratory, Washington, since September, 1927, and one of the research consultants of the American Rolling Mill Co., Middletown, O., for the past 18 months, has been appointed assistant director of research of that company, effective Sept. 1, 1931. He will head physical science department.

ONLY A FEW ARE LEFT!

A.S.S.T. men all over the country are pleased with the sturdy, attractive binders for Metal Progress which they have just received. Each binder holds six copies (one volume) securely. Bind each volume separately in these convenient binders.

The binders are made of durable board, silver in color, trimmed with black. A patented device holds each copy individually.

Order yours today! Check must accompany your order. The price is \$2.50 complete.



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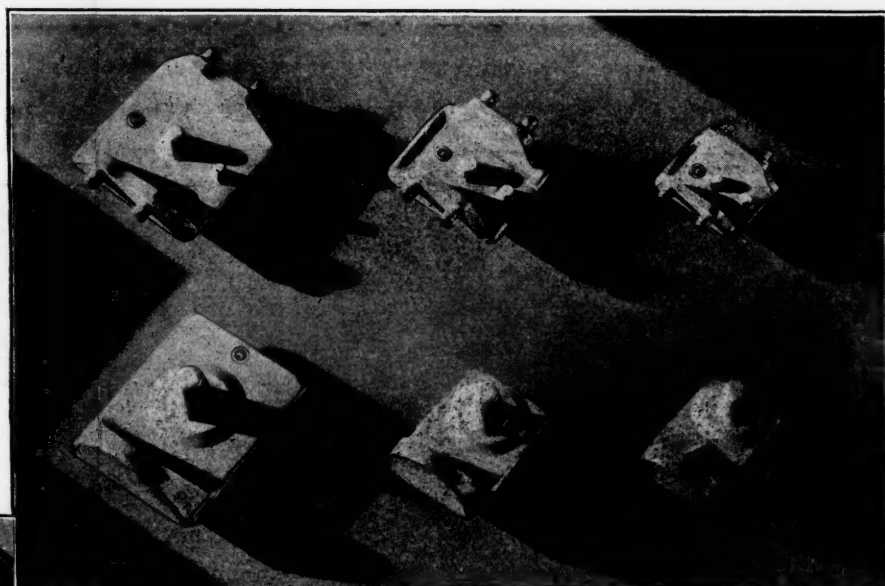
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Address _____

Date _____

An example of how Moore replaced 5 and 2 piece casting assemblies with single forgings — thus effecting greater strength, simplicity and economy in manufacture.

Right: Three sizes of the new forgings.
Below: The old 5 and 2 piece assemblies.



MODERN METHODS

Nowadays great emphasis is being placed on the particular merits of materials. There is a growing demand for forgings of monel, nickel, vanadium, brass, copper, nitralloy and the stainless irons and steels. The Moore policy is to make the advantages of specialized alloys available to manufacturers whose product requires forged parts. Moore metallurgists and modern heat treating equipment insure full development of the special qualities of all accepted alloys when made into forgings. Manufacturers whose forging requirements are unusual because of material or quantity requirements, will find an understanding of their problems and an ability to meet their needs at this completely-equipped 100 hammer plant. Moore Drop Forging Company, Springfield, Mass.

MOORE FORGINGS

"Our Performance
is your Protection"

THIS TIME you're THE WINNER

IT'S hard to believe that slow business ever helped anyone, but it's a fact.

During the past months when buyers have been playing hide and seek with your salesman, the research departments of industrial leaders have had time to forget current production problems and have concentrated on finding new and better ways for producing, fabricating, testing, treating, welding and using metals of all kinds.

The result: There are more than twice as many technical papers being offered for discussion this year at National Metal Congress than have ever been offered before. Many new fields have been invaded. Many startling discoveries have been made.

These new ideas and new discoveries will make it easier for you to meet the demands of business recovery. And they're yours—without cost or obligation—if you'll attend

NATIONAL METAL CONGRESS
AND
NATIONAL METAL EXPOSITION
TO BE HELD ON
COMMONWEALTH PIER, BOSTON
SEPTEMBER 21, 22, 23, 24 AND 25
OVER 200 EXHIBITORS OVER 60,000 SQ. FT. OF EXHIBIT.
OVER 40 TECHNICAL SESSIONS
MAKE YOUR PLANS NOW TO ATTEND

MACHINE TOOLS FIRST SAW LIGHT OF DAY IN MASSACHUSETTS

It was back in 1738 that Hugh Orr placed in operation the first trip hammer in the Western Hemisphere. And, incidentally, it was this same gentleman who, in 1748, produced the first muskets ever made in this country.

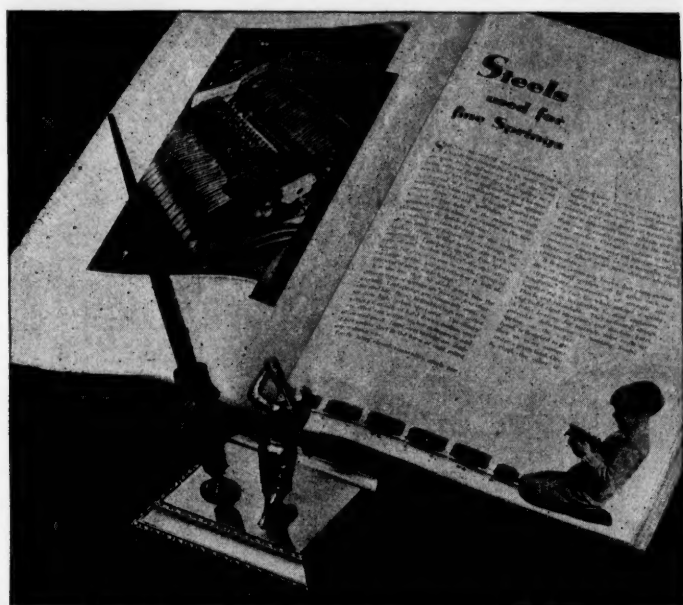
Today in Four New England States are 20% of all the machine tool manufacturing plants in the United States, and these plants produce 23% of the total machine tools and parts. And Mr. Orr's small musket business has grown into a \$20,000,000 industry, Connecticut and Massachusetts alone producing 74% of the firearms made in the United States.

With the machine tool industry so firmly rooted in New England it is not surprising that about 75% of all tacks entering into commerce are produced in Massachusetts; that of the nails and spikes (not made in rolling mills) made in this country, Massachusetts produces 37%; Connecticut, 35% of all wood screws; Connecticut, 41% of all needles, pins, hooks, eyes, snap fasteners, etc.

New England likewise leads in many other phases of the metal working industries. Many of the largest metal working plants in the world are within a few hours' automobile or train ride from Boston, the 1931 NATIONAL METAL CONGRESS city. You should plan to visit them when in Boston the week of September 21 to 25. They are, in themselves, a valuable education to men who work with metals.

These technical societies co-operate to make NATIONAL METAL CONGRESS the greatest annual event in the metal world:

American Welding Society
Institute of Metals Division, A.I.M.E.
Iron and Steel Division, A.I.M.E.
Machine Shop Practice Division, A.S.M.E.
Iron and Steel Division, A.S.M.E.
American Society for Steel Treating



NO TRAPS OR HAZARDS

— in THIS fairway —

It's straight shooting for the reader's eye from tee to cup in *Metal Progress*. Here, at last, is an industrial magazine which encourages reading. ★ Every picture, chart and micro is spaciously reproduced. Type sizes are generous throughout. Wide margins and plentiful white space on the large pages prevent eye-fatigue. ★ And if you don't think these innovations encourage reading, look these over:

"A new standard for technical journals" . . . "A masterpiece of periodical work . . . on account of its form will have a wider appeal" . . . "The finest thing we have seen in all our experience with the business publishing field" . . . "Fills a real need" . . . "A knock out" . . . "In the selection of paper, fine typography and editorial handling . . . an outstanding publication" . . . "Attractive to the eyes and mind" . . . "You have actually succeeded in making a technical article look tempting" . . .

If your product can be used in connection with the production, selection, fabrication, treatment, welding or handling of metals, METAL PROGRESS will give you both the medium and the audience ideally suited for your major effort. Prove it to yourself. We'll gladly send you a sample copy for your inspection. No obligation. Just write METAL PROGRESS, 7016 Euclid Avenue, Cleveland, Ohio.

Of the 6140 paid up readers of *Metal Progress*, 82.4% are men who are responsible for the selection and purchase of materials and equipment for their plants . . . presidents, vice presidents, general managers, factory managers, works managers, metallurgists and chemists. Of the remaining 17.6%, at least 15.3% have an important indirect influence on equipment and material purchases.

METAL PROGRESS

Statler Ballroom, Where A. S. S. T. Sessions Will Be Held



NEW BOOK ON "CREEP" PUBLISHED

A 285-page volume entitled "Creep of Metals" has just been published by Oxford University Press, 114 Fifth Ave., New York. The author is H. J. Tapsell, assistant in the engineering department of the National Physical Laboratory, Teddington, England. This book may be obtained for \$12.00.

A folder describing and illustrating the new Brown Potentiometer Pyrometer may be obtained from the Brown Instrument Co., Philadelphia.

SURFACE COMBUSTION OFFERS BOOK

An attractive booklet, "The Modern Soaking Pit," has recently been issued by the Surface Combustion Corp., Toledo. It describes the principles of controlled atmosphere pits and is illustrated with photographs of several recent installations.

The Morse Twist Drill and Machine Co., New Bedford, Mass., has published a new edition of the Tap Manual, containing valuable data on tap design, performance, and lubrication.

BASTIAN-BLESSING ELECTS MILLS

Ellsworth L. Mills has been elected vice-president of the Bastian-Blessing Co. He was formerly sales manager of the company and in his new position will continue in charge of sales.

Mr. and Mrs. Horace C. Knerr of Philadelphia have announced the birth of a son, Theodore Newbold, on July 25. Mr. Knerr is president of the Metallurgical Laboratories, Inc., and is active in the Philadelphia chapter.

Forethought

It pays to use Good Tool Steel.

The name Columbia for over a quarter century has stood for all that is "good" in tool steel.

Good—in well balanced composition to insure maximum performance.

Good—in preparation that gives and maintains uniform results.

Good—from the standpoint of all standard tests and inspections, with no fancy names for imaginary qualities.

Good—in the qualities that produce profits—the most important thing of all.

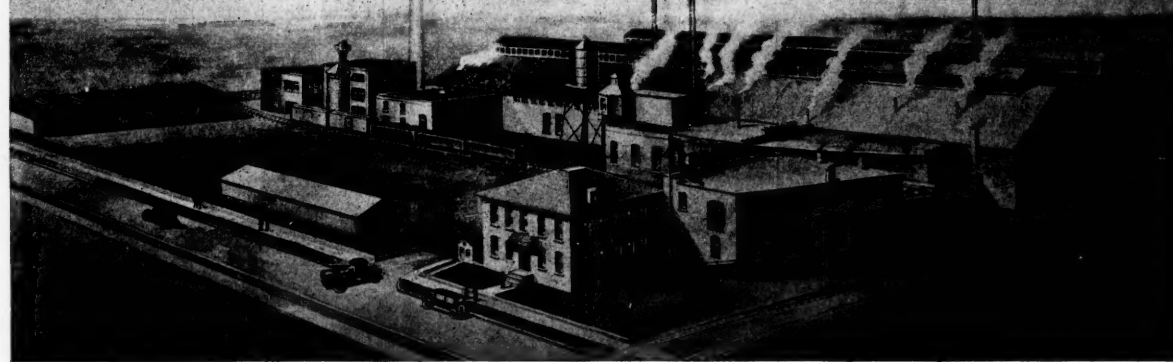
The thought "It Pays to Use Good Tool Steel" has and will always dictate the manufacturing policy for the many products of this company.

ARTHUR T. CLARAGE,
President

Columbia Tool Steel Company

Main Office and Works: Chicago Heights, Illinois

CHICAGO	KANSAS CITY	NEWARK	ST. PAUL
CINCINNATI	LOS ANGELES	NEW ORLEANS	SAN FRANCISCO
CLEVELAND	MILWAUKEE	PORTLAND	SHREVEPORT
DETROIT	HOUSTON	ST. LOUIS	WORCESTER



BOOK ON ROLLING AVAILABLE

The Theory and Practice of Rolling Steel, by Wilhelm Tafel, Professor of Steel Works Engineering, Technische Hochschule, Breslau Germany, Translated. Second Edition, 6x9, 304 pages, 165 illustrations, cloth bound. Postpaid in U. S. A., \$6.15. Order through American Society for Steel Treating, 7016 Euclid Ave., Cleveland.

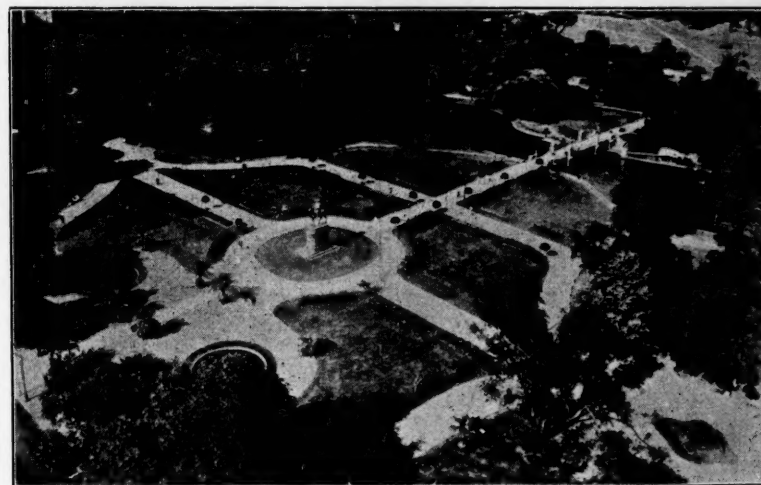
An introduction to the theory and understanding of rolling and roll design. Translated from the original German and adapted to American practice, the aim is to aid the reader in solving his own problems.

The author discusses nomenclature, calculation of spreading slippage, gripping and defects in stock due to improper roll design. It deals with wear of rolls, overfilling and underfilling, location of the passes in the roll, with side work and many other features of design. The text deals with errors made in design and their consequences and then enters into roll design for flats, skelp and hand and guide squares, giving the reasons for each step. Design of roughing rolls, roll train resistance and design for structural material and simple shapes are treated in detail.

Old State House



PUBLIC GARDEN IN BOSTON



MUSEUM OF FINE ARTS



E. K. SMITH HAS NEW POSITION

E. K. Smith, formerly with the Stockham Pipe and Fittings Co., Birmingham, has been named metallurgist for the Electro Metallurgical Sales Corp., with offices in the Carbide and Carbon Bldg., No. Michigan Ave., Chicago.

ARMSTRONG WITH TIMKEN-DETROIT

Leroy K. Armstrong, formerly assistant manager of Fales and Jenks Machine Co., Pawtucket, R. I., is now in the domestic oil burner sales department of the Timken-Detroit Co., Providence, R. I.

Complete Program For The Events Planned by A. I. M. E.

The detailed program for the meeting of the A. I. M. E. follows. Papers available as separates are so indicated in the program: T.P., indicating a *Technical Publication*; Pre., a *Preprint*; M & M, reprinted from *Mining and Metallurgy*. *Technical Publications* will be mailed with the September number of *Mining and Metallurgy* or were mailed with previous numbers.

Monday, Sept. 21
Registration, Georgian Room, Hotel Statler
Tuesday, Sept. 22
8:30 a.m.—Inspection trip to Watertown Arsenal, Watertown, Mass.
9:30 a.m.—Institute of Metals Division, Georgian Room, Hotel Statler.
Copper and Copper Alloys Session
J. L. Christie, Bridgeport Brass Co., Bridgeport, Conn., chairman
W. A. Scheuch, Western Electric Co., Chicago, vice-chairman
EQUILIBRIUM DIAGRAM OF THE COPPER-RICH COPPER-SILVER ALLOYS, By Cyril Stanley Smith and W. Earl Lindler, American Brass Co., Waterbury, Conn. (T.P. 433)
THE BETA TO ALPHA TRANSFORMATION IN A HOT-FORGED BRASS SHAPE, By Robert S. Baker, American Brass Co., Waterbury, (Pre.)
COPPER EMBRITTLEMENT, By L. L. Wyman, General Electric Co., Schenectady, (Pre.)
SOME IMPORTANT FACTORS CONTROLLING THE CRYSTAL MACROSTRUCTURE OF COPPER WIRE BARS—By L. H. DeWald, Western Electric Co., Chicago. (T.P. 429)
EFFECT OF SECONDARY COPPER ON THE METAL MARKET AND ITS RELATION TO DOMESTIC PRODUCTION AND CONSUMPTION, By Percy E. Barbour, New York. (M. & M.)
12:15 p.m.—Luncheon Meeting, Executive Committee, Institute of Metals Division, Parlor B, Hotel Statler.
2:00 p.m.—Institute of Metals Division, Georgian Room, Hotel Statler.

General Session
E. M. Wise, International Nickel Co., Bayonne, N. J., chairman
T. S. Fuller, General Electric Co., Schenectady, vice-chairman
INFLUENCE OF STRESS ON CORROSION, By D. J. McAdam, Jr., Bureau of Standards, Washington. (T.P. 417)
SEASONAL VARIATION IN RATE OF IMPINGEMENT CORROSION, By Alan Morris, Bridgeport Brass Co., Bridgeport, Conn. (T.P. 431)
RELATION OF CRYSTAL ORIENTATION TO THE BENDING QUALITIES OF A ROLLED ZINC ALLOY, By Gerald Edmunds and M. L. Fuller, New Jersey Zinc Co., Palmerton, N. J. (Pre.)
PREFERRED ORIENTATION PRODUCED BY COLD ROLLING IN SHEETS OF ALUMINUM, NICKEL, COPPER AND SILVER, By Cleveland B. Hollabaugh and Wheeler P. Davey, Pennsylvania State College.

Wednesday, Sept. 23
8:30 a.m.—Inspection trip to Bethlehem Shipbuilding Corp., Fore Rive Plant, Quincy, Mass.; option, a combined trip to the Boston Gear Works, Norfolk Downs, Mass., and Pneumatic Tool Co., Norfolk Downs, Mass.
12:15 p.m.—Luncheon Meeting, Executive Committee, Iron and Steel Division, Parlor B, Hotel Statler.
12:15 p.m.—Luncheon Meeting, Advisory Committee A.S.T.M. Committee B-3 on Corrosion of Nonferrous Metals. T. S. Fuller, Chairman.
2:00 p.m.—Institute of Metals and Iron and Steel Divisions. Ball Room Foyer.

Joint Session on Age Hardening
N. B. Pilling, International Nickel Co., Bayonne, N. J., chairman
W. E. Ruder, General Electric Co., Schenectady, vice-chairman
PREPARATION OF A UNIFORM ABRASIVE FOR METALLOGRAPHIC POLISHING, By J. L. Rodda, New Jersey Zinc Co., Palmerton, N. J. (T.P. 438)
AGE-HARDENING OF AUSTENITE, By F. R. Hensel, Westinghouse Electric & Mfg. Co., East Pittsburgh. (T.P. 419)
SOME DEVELOPMENTS IN HIGH-TEMPERATURE ALLOYS IN THE NICKEL-COBALT-IRON SYSTEM, By C. R. Austin, Pittsburgh, and G. P. Halliwell, Carnegie Institute of Technology, Pittsburgh. (T.P. 430)
AGE-HARDENING COPPER-TITANIUM ALLOYS, By F. R. Hensel and E. I. Larsen, Westinghouse Electric & Mfg. Co., East Pittsburgh. (T.P. 432)
6:30 p.m.—Joint Dinner of Institute of Metals and Iron and Steel Divisions, Georgian Room, Hotel Statler. (Informal. Ladies invited.)
Alan Kiseck, vice-president, Climax Molybdenum Co., will give a non-technical talk on "Molybdenum."

Thursday, Sept. 24
8:30 a.m.—Inspection trip to General Electric Co., West Lynn, Mass.; option, Naamag Steam Cotton Co., Salem, Mass.
9:30 a.m.—Iron and Steel Division, Georgian Room, Hotel Statler.

Alloys of Iron Session
Albert Sauveur, Harvard University, chairman
E. C. Bain, U. S. Steel Research Laboratory, Kearny, N. J., vice-chairman
TRANSFORMATIONAL CHARACTERISTICS OF IRON-MANGANESE ALLOYS, By Howard Scott, Westinghouse Electric & Mfg. Co., East Pittsburgh. (T.P. 435)
THE COMPOSITION LIMITS OF THE ALPHA-GAMMA LOOP IN THE IRON-TUNGSTEN SYSTEM, By W. P. Skyes, Cleveland Wire Works, General Electric Co., Cleveland. (T.P. 428)
IRON ALLOYS—MAGNETIC PROPERTIES VERSUS ALLOTROPIC TRANSFORMATIONS—A CONNECTING LINK?, By T. D. Yensen and N. A. Ziegler, Westinghouse Electric & Mfg. Co., East Pittsburgh. (T.P. 427)
LOW CARBON STEELS, By H. B. Pulsifer, Cleveland. (T.P. 426)
12:15 p.m.—Luncheon Meeting, Papers Committee, Iron and Steel Division, Parlor B, Statler Hotel.
2:00 p.m.—Iron and Steel Division, Georgian Room, Hotel Statler.

General Session
W. J. MacKenzie, Republic Steel Corp., South Chicago, chairman
F. N. Speller, National Tube Co., Pittsburgh, vice-chairman
THE ELECTROLYTIC EXTRACTION OF MnO, MnS, FeS, AND SiO₂ INCLUSIONS FROM PLAIN CARBON STEELS, By G. R. Fitterer, U. S. Bureau of Mines, Pittsburgh. (T.P. 440)
INCLUSIONS AND THEIR EFFECT ON IMPACT STRENGTH OF STEEL, II, By A. B. Kinzel and Walter Crafts, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y. (T.P. 436)
DILATOMETRIC STUDY OF CHROME NICKEL IRON ALLOYS, By V. N. Krivobok and Maxwell Gensamer, Carnegie Institute of Technology, Pittsburgh. (T.P. 434)
4:00 p.m.—Iron and Steel and Institute of Metals Divisions, Georgian Room, Hotel Statler.

Science Lecture
F. M. Becket, Union Carbide Co., New York, chairman
Sam Tour, Lucius Pitkin, Inc., New York, vice-chairman
RECENTLY DISCOVERED COMPLEXITIES IN THE PROPERTIES OF SIMPLE SUBSTANCES, By Dr. P. W. Bridgman, Hollis Professor of Mathematics and Natural Philosophy, Harvard University.

Friday, Sept. 25
8:30 a.m.—Inspection trip to United Shoe Machinery Co., Beverly, Mass.; option, Trimont Mfg. Co., Roxbury, Mass.
2:00 p.m.—Iron and Steel Division and American Society for Steel Treating.

Session on Nitriding and Carburizing
THE DEVELOPMENT OF CONTINUOUS GAS CARBURIZING, By R. J. Cowan, Surface Combustion Co., Toledo. (T.P. 439)
2:00 p.m.—Iron and Steel and Institute of Metals Divisions.

Joint Symposium on Metallurgical Education
G. B. Waterhouse, Massachusetts Institute of Technology, Cambridge, Mass., chairman

THE WORLD OF METALLURGY, By J. A. Mathews, Crucible Steel Co. of America, New York. (Pre.)
METALLURGICAL FUNDAMENTALS PRESENT AND FUTURE, By Charles G. Maier, U. S. Bureau of Mines, Berkeley, Calif. (M & M)

Three Papers Sponsored by S. A. E. on Session Sept. 23

The S.A.E. has planned the following program:

Wednesday, Sept. 23
9:30 A.M., Georgian Room, Hotel Statler
Chairman, F. P. Gilligan, Henry Souther Engineering Corp.
HEAT TREATING METHODS AND COSTS, E. F. Davis, Warner Gear Co.
RECENT DEVELOPMENTS IN HEAT TREATING BALL BEARING RACES, Dr. Haakon Styri, SKF Industries, Inc.
CHARACTERISTICS OF ALLOYED CAST IRON, F. W. Shipley, Caterpillar Tractor Company.

STURTEVANT CO. NAMES MANAGERS

B. F. Sturtevant Co., Hyde Park, Boston, has appointed W. L. Hunken, Phillip Cohen and E. A. Engdahl to manage the company's offices in Greensboro, N. C., Cleveland and Seattle, respectively.

REPUBLIC PROMOTES HAMAKER

L. S. Hamaker, formerly advertising manager of the Republic Steel Corp., has been appointed manager of sales promotion for the corporation, effective August 1. Mr. Hamaker will make headquarters at Youngstown.

American Welding Society Has Planned Many Events

The officials of the American Welding Society have announced a technical program for their sessions at the National Metal Congress in Boston, Sept. 21-25, that holds many interesting features. All sessions will be at the Copley Plaza Hotel. The program follows:

Monday, Sept. 21
9:45 a.m.—Registration
Facilities will be provided throughout the week from 9:30 a.m. to 5:00 p.m. commencing Monday, Sept. 21 at 9:45 a.m.

3:00 p.m.—Technical Session
Presiding Officer—L. S. Meisseiff, Chairman, Structural Steel Welding Committee.

A review of the work of this committee, the investigations undertaken by it and the results of a series of 1395 specimens made up by 39 fabricating shops and tested at 24 laboratories will be presented by the Executive Committee of the Structural Steel Welding Committee.

6:00 p.m.—Dinner Meeting, Board of Directors, Copley-Plaza Hotel
Presiding Officer—E. A. Doyle, President, A.W.S.

Tuesday, Sept. 22
9:45 a.m.—Business Session
Presiding Officer—E. A. Doyle, President, A.W.S.

This will be in the nature of a few introductory remarks by President Doyle; address of welcome, response by C. A. McCune, Chairman, 1931 Fall Meeting & Exposition Committee, and transaction of formal business.

10:30 a.m.—Technical Session
Presiding Officer—E. A. Doyle, President, A.W.S.

THE YALE UNIVERSITY GROUP OF WELDED BUILDINGS, by G. D. Fish, Consulting Engineer.

WELDING SOLVES ANOTHER PROBLEM, by F. P. McKibben, Consulting Engineer.

(Continued in Next Column)

A. S. M. E. Technical Session Is Planned for Sept. 22

The sessions of the National Metal Congress program of the American Society for Mechanical Engineers will be held on Tuesday, Sept. 22, at the Hotel Statler. A cooperative session on sheet steel in the morning and three technical papers in the afternoon provide a varied program for members of the Machine Shop Practice and Iron and Steel divisions of the Society.

The program sponsored by the A.S.M.E. is as follows:

Tuesday Morning, Sept. 22
Sheet Steel Session
Members may attend the session on sheet steel rolling in which the Iron and Steel division cooperates with the A.S.S.T.
Alternative is a trip to Watertown Arsenal.

Tuesday Afternoon, Sept. 22
Technical Session, Machine Shop Practice Division
F. C. Spencer, chairman
POWER TRANSMISSION WITH CAST IRON PULLEYS AND PAPER PULLEYS, by C. A. Norman and G. N. Moffatt, Ohio State University, Columbus, Ohio.
POSITIVE DRIVE EQUIPMENT, by C. R. Weiss, Link Belt Co., Indianapolis.
RADIOGRAPHIC INSPECTION OF STEEL CASTINGS AND WELDED STRUCTURES, by H. R. Isenberger, St. John X-Ray Corp., New York.
Moving pictures of research work in gears at Westinghouse Electric & Mfg. Co. and on German machine tool progress as exhibited at the Leipzig Trade Fair.

FANEUIL HALL



Faneuil Hall, known as the "Cradle of Liberty," is one of Boston's famous old buildings well worth a visit.

A. W. S. COMMITTEE REPORTS ABOUT STRUCTURAL WELDING

Report Obtainable from Society

The Structural Steel Welding Committee of the A. W. S. has issued a report giving the results of a program of several years of investigational work. This report will be presented by the Executive Committee of the Structural Steel Committee in condensed summarized form. Summary and conclusions will be presented by H. M. Priest, Vice Chairman of the Committee.

The report itself, covering over two hundred pages, is now available for distribution by application to the American Welding Society. This program as completed involved the welding and testing of about twenty-five hundred specimens, including fifty-five forms of joints in 169 sizes.

The participants in this investigation included three steel mills, 39 fabricating shops, 61 welders, 18 inspectors and 124 testing laboratories. The work was distributed over the central and eastern portions of the United States.

GOLDEN GATE LOSES TWO BY DEATH

The Golden Gate Chapter recently sustained great loss in the deaths of Henry J. Niemann and Joseph Eastwood. Mr. Niemann was a member of the board of directors of Enterprise Foundry Co., and Mr. Eastwood was president and general manager of American Forge Co. Mr. Eastwood was a member of the chapter executive committee. His place has been taken by Cecil Hawley, also of American Forge Co.

AUTOMATIC GAS CUTTING, by R. F. Helmkamp, Air Reduction Sales Co.
3:00 p.m.—Outing. Trip to Pemberton by boat
Shore dinner and sports, returning in evening for moonlight sail. Transportation from hotel to pier by busses, leaving hotel promptly at 3:00 p.m.—Price \$2.00 per person.

Wednesday, Sept. 23
9:45 a.m.—Technical Session
Presiding Officer—H. P. Peabody, Chairman, Boston Section, A.W.S.
THE FUTURE OF WELDED SHIP CONSTRUCTION, by J. Kjekstad, United Dry Docks, Inc.
RESISTANCE WELDING OF METAL FABRIC, by W. T. Ober, Thomson Gibb Electric Welding Co.
FOUR PROBLEMS ENCOUNTERED IN FLASH-WELDING MILD STEEL, by E. R. Torgler, S. R. Dresser Manufacturing Co.

2:00 p.m.—Technical Session
Presiding Officer—E. H. Ewertz, Past President.
WELDING OF GALVANIZED STEEL, H. F. Reinhart, Chief Engineer, J. B. Colt Co.

THE ENGINEER, THE WELDER AND THE FOUNDRYMAN, by P. J. Horgan, Lynn Works, General Electric Company.
MAXIMUM STRESS: ITS INFLUENCE ON COST AND SERVICE LIFE OF A STRUCTURE, by Everett Chapman, Lukenweld, Inc.

FATIGUE PROPERTIES OF WELDS, by R. A. Weinman, General Electric Co.

Thursday, Sept. 24
9:45 a.m.—Technical Session
Presiding Officer—J. J. Crowe, member of Executive Committee, A.W.S.

THE RELIEF OF WELDING STRAINS BY ANNEALING, by C. H. Jennings, Westinghouse Electric & Mfg. Co.

WELDED PIPINGS AND FITTINGS IN HEATING INSTALLATIONS, by F. J. Maurer, Air Reduction Sales Company.

WELDING OF COPPER AND BRASS PIPING, by H. V. Inskeep, Linde Air Products Company.

2:00 p.m.—Technical Session
Presiding Officer—F. P. McKibben, Senior Vice-President, A.W.S.

WELDING OF PIPING IN NEW YORK HOSPITAL—CORNELL MEDICAL CLINIC. (Author to be announced later), by representative of Almirall & Co.

FACTORS AFFECTING THE WELDABILITY OF STEEL, by Wilmer E. Stine, The Lincoln Electric Company.

PREPARED DISCUSSION OF PAPER "FACTORS AFFECTING THE WELDABILITY OF STEEL," by F. T. Llewellyn, U. S. Steel Corporation.

Friday, Sept. 25
9:45 a.m.—Technical Session
Presiding Officer—P. P. Alexander, Chairman, Boston Section, Fundamental Research Committee, A.W.S.

WELDING OF EVERDUR TANKS, by Ira T. Hook, American Brass Company and M. Powell, Whitlock Coil Pipe Company.

UNDERWATER CUTTING. A lecture and motion picture, by Charles Kandal, Craftswood Equipment Corp.

SEMI-AUTOMATIC GAS WELDING, by representative of Linde Air Products Co.

WELDING EXPOSITION
Commonwealth Pier

The Exposition will open at 12 noon on Monday.

It will be open every day at noon and close at 10:00 p.m. every night except Thursday when it will close at 6:00 p.m.

Employment Service Bureau

Address answers care of A. S. T., 7016 Euclid Ave., Cleveland, unless otherwise stated.

POSITIONS WANTED

METALLURGIST: 4 years in steel plant
metallurgical laboratory, 3 years in metallurgical department of automobile gear plant.
Desires position in a laboratory. Address 8-10.
HEAT TREATING FOREMAN: Age 38, 14 years experience in heat treating, carburizing and operation of electric furnaces. Has sales experience. Prefers Cleveland. Address 8-20.

Condensed Program, National Metal Congress, Boston

Monday, Sept. 21	Tuesday, Sept. 22	Wednesday, Sept. 23	Thursday, Sept. 24	Friday, Sept. 25
MORNING SESSIONS				
A. S. S. T. TECHNICAL SESSION Statler Ballroom	A. S. S. T. TECHNICAL SESSION Statler Ballroom "Sheet Steel"	A. S. S. T. ANNUAL MEETING CAMPBELL LECTURE Statler Ballroom	A. S. S. T. TECHNICAL SESSION Statler Ballroom	A. S. S. T. TECHNICAL SESSION Statler Ballroom "Stainless Alloys"
A. W. S. REGISTRATION Copley-Plaza	A. W. S. BUSINESS MEETING TECHNICAL SESSION Copley-Plaza "Structural Welding"	A. W. S. TECHNICAL SESSION Copley-Plaza	A. W. S. TECHNICAL SESSION Copley-Plaza	A. W. S. TECHNICAL SESSION Copley-Plaza
A. I. M. E. REGISTRATION Georgian Room Statler	A. I. M. E. (Institute of Metals) TECHNICAL SESSION Georgian Room Statler "Copper and Its Alloys"	A. I. M. E. NO SESSION	A. I. M. E. (Iron and Steel) TECHNICAL SESSION Georgian Room Statler "Alloys of Iron"	A. I. M. E. NO SESSION
		S. A. E. TECHNICAL SESSION Georgian Room Statler		
AFTERNOON SESSIONS				
A. S. S. T. TECHNICAL SESSION Statler Ballroom	A. S. S. T. TECHNICAL SESSION Statler Ballroom	A. S. S. T. TECHNICAL SESSION Statler Ballroom "Melting"	A. S. S. T. TECHNICAL SESSION Statler Ballroom "Age Hardening"	A. S. S. T. TECHNICAL SESSION Statler Ballroom
A. W. S. TECHNICAL SESSION Copley-Plaza	A. W. S. OUTING	A. W. S. TECHNICAL SESSION Copley-Plaza	A. W. S. TECHNICAL SESSION Copley-Plaza	A. W. S. NO SESSION
	A. I. M. E. (Institute of Metals) TECHNICAL SESSION Georgian Room Statler	A. I. M. E. (Joint Session) TECHNICAL SESSION Statler Ballroom Foyer "Age Hardening"	A. I. M. E. (Iron and Steel) TECHNICAL SESSION Georgian Room Statler	A. I. M. E. (Joint Session) SYMPOSIUM Georgian Room Statler "Metallurgical Education"
	A. S. M. E. (Mach. Shop Practice) TECHNICAL SESSION Statler Ballroom Assembly		A. I. M. E. SCIENCE LECTURE 4:00 P. M. Georgian Room Statler	
EVENING EVENTS				
	A. I. M. E. DINNER Statler Hotel Georgian Room		A. S. S. T. BANQUET Statler Ballroom A. W. S. BANQUET AND DANCE Copley-Plaza	